

Tennessee Department of Environment and Conservation

DOE Oversight Division



Status Report to the Public

Fiscal Year 2003

This report was published
with 100% Federal Funds
under Grant Numbers
DE-FG05-96OR22520
DE-FG05-96OR22521

State of Tennessee Policy of Non-Discrimination

Pursuant to the State of Tennessee's policy of non-discrimination, the Tennessee Department of Environment and Conservation does not discriminate on the basis of race, sex, religion, color, national or ethnic origin, age, disability, or military service in its policies, or in the admission or access to, or treatment or employment in its programs, services or activities. Equal Employment Opportunity/Affirmative Action inquiries or complaints should be directed to the EEO/AA Coordinator Office of General Counsel at 401 Church Street, 20th Floor L&C Tower, Nashville, TN 37243, 1-888-867-7455. ADA inquiries or complaints should be directed to the ADA Coordinator, Human Resources Division at 401 Church Street, 12th Floor L&C Tower, Nashville, TN 37243, 1-888-867-5827. Hearing impaired callers may use the Tennessee Relay Service (1-800-848-0298).

To reach your local
ENVIRONMENTAL ASSISTANCE CENTER
Call 1-888-891-8332 or 1-888-891-TDEC



Tennessee Department of Environment and Conservation, Authorization No. 327034, 500 copies. This public document was promulgated at a cost of \$6.89 per copy. September 2003.

Contents

TERMS & ACRONYMS	ii	4.0 REGIONAL ENVIRONMENT	26
EXECUTIVE SUMMARY	iii	4.1 WATER QUALITY	26
BACKGROUND	iii	4.2 AIR QUALITY	34
SCOPE OF THIS STATUS REPORT	iv	4.3 SOIL AND SEDIMENT QUALITY	41
MAJOR FINDINGS	iv	4.4 FOOD AND WILDLIFE QUALITY	42
KEY ISSUES AND CHALLENGES	v	5.0 KEY CHALLENGES	47
1.0 INTRODUCTION	1	5.1 GROUNDWATER MANAGEMENT STRATEGIES	47
1.1 HISTORY OF THE PROBLEM	1	5.2 LONG-TERM STEWARDSHIP RESPONSIBILITIES	47
1.2 DIVISION OBJECTIVES	3	5.3 THE FEDERAL COMMITMENT	47
2.0 JURISDICTION	4	5.4 CHARACTERIZATION AND DISPOSAL OF RADIOACTIVE WASTE	48
2.1 TENNESSEE OVERSIGHT AGREEMENT AND THE DOE OVERSIGHT DIVISION	4	5.5 INCORPORATING HISTORIC PRESERVATION INTO CLEANUP ACTIVITIES	49
2.2 FEDERAL FACILITY AGREEMENT	4	5.6 IMPACTS OF THE ACCELERATED CLEANUP ON REINDUSTRIALIZATION	49
2.3 NATIONAL ENVIRONMENTAL POLICY ACT	5	6.0 HEALTH STUDIES & EMERGENCY RESPONSE	50
ENVIRONMENTAL LAWS (sidebar)	6	6.1 HEALTH STUDIES	50
2.4 OTHER PLANNING AND POLICY ISSUES	8	6.2 EMERGENCY RESPONSE	50
2.5 NATURAL RESOURCE DAMAGE ASSESSMENT	8	7.0 OUTREACH	53
3.0 ENVIRONMENTAL MANAGEMENT	9	7.1 TDEC DOE OVERSIGHT DIVISION	53
3.1 RECENT PROGRESS	9	7.2 OAK RIDGE RESERVATION LOCAL OVERSIGHT COMMITTEE	55
3.2 OAK RIDGE NATIONAL LABORATORY	11	7.3 LOCAL GOVERNMENT ENVIRONMENTAL BOARDS	56
3.3 Y-12 NATIONAL SECURITY COMPLEX	15	7.4 DOE OUTREACH	57
3.4 EAST TENNESSEE TECHNOLOGY PARK WATERSHED	16	APPENDIX	59
3.5 WASTE MANAGEMENT	20		

The Tennessee Department of Environment and Conservation, Department of Energy Oversight Division, gratefully acknowledges the Oak Ridge Reservation Local Oversight Committee and the following individuals for their contributions to this report:

Susan Gawarecki
LOC Executive Director

Leo Williams
Editorial Consultant

Terms & Acronyms

ATSDR	Agency for Toxic Substances and Disease Registry	mrem	millirem
BMAP	Biological Monitoring and Abatement Program	MSRE	Molten Salt Reactor Experiment
BNFL	British Nuclear Fuels LLC	NEPA	National Environmental Policy Act of 1969
CAP	Oak Ridge Reservation Local Oversight Committee Citizens' Advisory Panel	NPDES	National Pollutant Discharge Elimination System
CDC	Centers for Disease Control and Prevention	ORNL	Oak Ridge National Laboratory
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980	ORR	Oak Ridge Reservation
D&D	decontamination and decommissioning	ORRHES	Oak Ridge Reservation Health Effects Subcommittee
DOE	U.S. Department of Energy	ORSSAB	Oak Ridge Site Specific Advisory Board
EA	Environmental Assessment	OUO	Official Use Only
EIS	Environmental Impact Statement	PCB	polychlorinated biphenyl
EMWMF	Environmental Management Waste Management Facility	RCRA	Resource Conservation and Recovery Act of 1976
EPA	U.S. Environmental Protection Agency	REDC	Radiochemical Engineering and Development Center
EQAB	City of Oak Ridge Environmental Quality Advisory Board	ROD	Record of Decision
ERAMS	Environmental Radiation Ambient Monitoring System	SIOU	Surface Impoundments Operable Unit
ETTP	East Tennessee Technology Park	SNF	spent nuclear fuel
FFA	Oak Ridge Federal Facility Agreement	SNS	Spallation Neutron Source
FONSI	Finding of No Significant Impact	STGWG	State and Tribal Government Working Group
FY	fiscal year	SWSA	Solid Waste Storage Area
HFIR	High-Flux Isotope Reactor	TDEC	Tennessee Department of Environment and Conservation
ITRC	Interstate Technology and Regulatory Council	TEMA	Tennessee Emergency Management Agency
LOC	Oak Ridge Reservation Local Oversight Committee	TOA	Tennessee Oversight Agreement
M&EC	East Tennessee Materials and Energy Corporation	TRU	transuranic
MACT	Maximum Achievable Control Technology	TSCA	Toxic Substances Control Act of 1976
		TVA	Tennessee Valley Authority
		UF₆	uranium hexafluoride
		WAG	Waste Area Grouping
		WIPP	Waste Isolation Pilot Plant

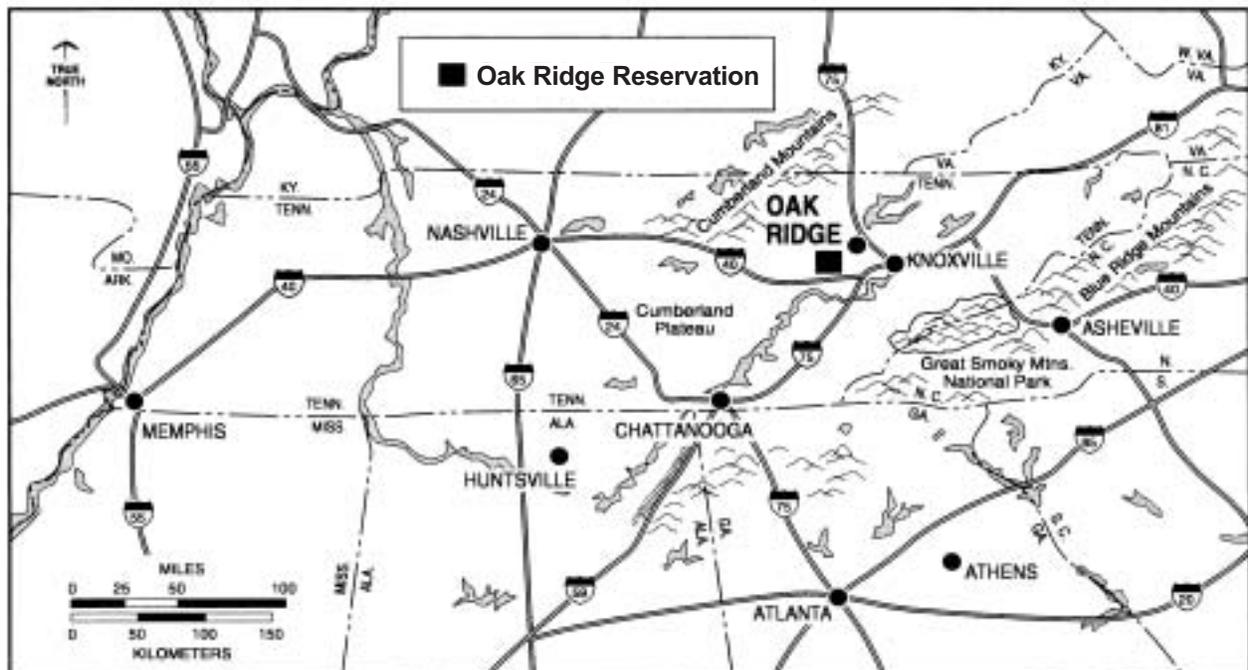
Executive Summary

BACKGROUND

In 1942, construction began on enormous complexes across the nation created to support the Manhattan Project, a massive, top-secret effort during World War II to build the atomic bomb. The 35,545-acre Oak Ridge Reservation (ORR) in Tennessee remains as a legacy to the Manhattan Project and to the Cold War that followed. The ORR is currently owned by the U.S. Department of Energy (DOE), and approximately 15 percent of its total area is contaminated by hazardous and radioactive materials.

During World War II, four plants were built on the ORR to create materials for nuclear weapons; these plants were given the code names S-50, K-25, Y-12, and X-10. S-50, a thermally operated uranium enrichment facility, was operated for about a year and dismantled when it proved inefficient. K-25 and Y-12 enriched uranium using more successful techniques: K-25 used gaseous diffusion and Y-12 used electromagnetic separation. X-10 developed the technology to produce plutonium, which was then transferred to the Hanford Plant in Washington for full-scale production.

K-25, Y-12, and X-10 still exist as East Tennessee Technology Park (ETTP), the Y-12 National Security Complex, and Oak Ridge National Laboratory (ORNL). During the Cold War, these facilities played a key role in maintaining materials and components for



The Oak Ridge Reservation is located in East Tennessee. Map courtesy of U.S. Department of Energy (Oak Ridge Reservation Annual Site Environmental Report for 1998, DOE/ORO/2091).

Executive Summary

nuclear weapons and in preserving a technological lead over the Soviet Union. In the past decade, the missions of Y-12 and ORNL have continued to evolve, while ETTP has been targeted for cleanup and closure.

Over the last 60 years, DOE and agencies that preceded it contaminated more than 500 sites on or near the ORR. This legacy of contamination is being cleaned up to levels that comply with current environmental laws, particularly the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. Indeed, much of the DOE mission now centers on environmental management.

SCOPE OF THIS STATUS REPORT

The Tennessee Department of Environment and Conservation DOE Oversight Division (the “division”) performs independent monitoring and oversight of DOE’s cleanup and waste-management actions. The division has performed this role since the Tennessee Oversight Agreement was signed in 1991.

This status report summarizes the state of Tennessee’s perspective on federal cleanup progress at the ORR. The results of state monitoring and analysis are also evaluated, as are the quality and effectiveness of DOE environmental monitoring and surveillance programs.

MAJOR FINDINGS

DOE undertook a number of new high-risk projects this year and completed several begun in prior years. In its oversight of these activities during state fiscal year 2003, the division found no immediate threats to public health from current activities on the ORR. DOE must continue to properly manage radioactive and hazardous materials and wastes found across the ORR, to protect the public, workers, the environment, and national security.

DOE is attempting to accelerate cleanup on the ORR, with a goal of accomplishing the massive amounts of work necessary to achieve several site closures by 2008.

DOE is attempting to accelerate cleanup on the ORR, with a goal of accomplishing the massive amounts of work necessary to achieve several site closures by 2008. The division has renegotiated schedules to enable this program to move forward in a more flexible manner. However, delays and problems have already begun to surface. If cleanups fail to progress as promised or if shortcuts are taken due to funding shortfalls or schedule constraints, then there is potential for harm to the public or the environment.

The on-site Environmental Management Waste Management Facility (EMWMF) has a key role in providing a low-cost disposal option for some cleanup wastes. The division oversees the process for deciding which wastes will be allowed in the facility and which must be sent off-site for disposal. Problems with rainwater and runoff management this

Executive Summary

year have called the design of the EMWFM into question. DOE plans to modify the facility to better address these problems.

Overall, there have been no major changes, either positive or negative, to the quality of air, surface water or groundwater leaving the ORR over the past year.

KEY ISSUES AND CHALLENGES

The division has identified six major issues and challenges for DOE.

1. Groundwater management strategies must be determined as source cleanups are completed. Because groundwater is a long-term remediation problem, DOE must ensure adequate controls are in place to monitor, maintain, and modify groundwater remedies as necessary well into the future.
2. Effective long-term stewardship must include record keeping, enforcement, surveillance, maintenance, monitoring, and sufficient funding. DOE's stewardship plans are still vague, although long-term needs should be accounted for as remediation actions take place.
3. DOE must maintain commitment to its Accelerated Cleanup Plan by providing sufficient resources to meet the agreed milestones. Problems with the schedule have arisen this year. DOE's responsibility to keep the public informed about environmental decisions must also be maintained, despite increased security.
4. Characterization and disposal of stored radioactive waste continues to be a problem. DOE must show a higher priority on this activity to achieve accelerated cleanup. Treatment, shipping and disposal of transuranic waste must also be accomplished in a timely manner, and DOE must resolve national issues that threaten to delay this activity.
5. Plans for documentation, preservation, and commemoration of historic facilities and artifacts must be finalized before demolition of major Manhattan Project-era facilities proceeds much further. The public should be included in these decisions.
6. The Accelerated Cleanup Plan has brought major changes to the reindustrialization program at ETTP. Close coordination is critical between DOE and companies in the reindustrialization program to resolve conflicts that will arise during cleanup activities.

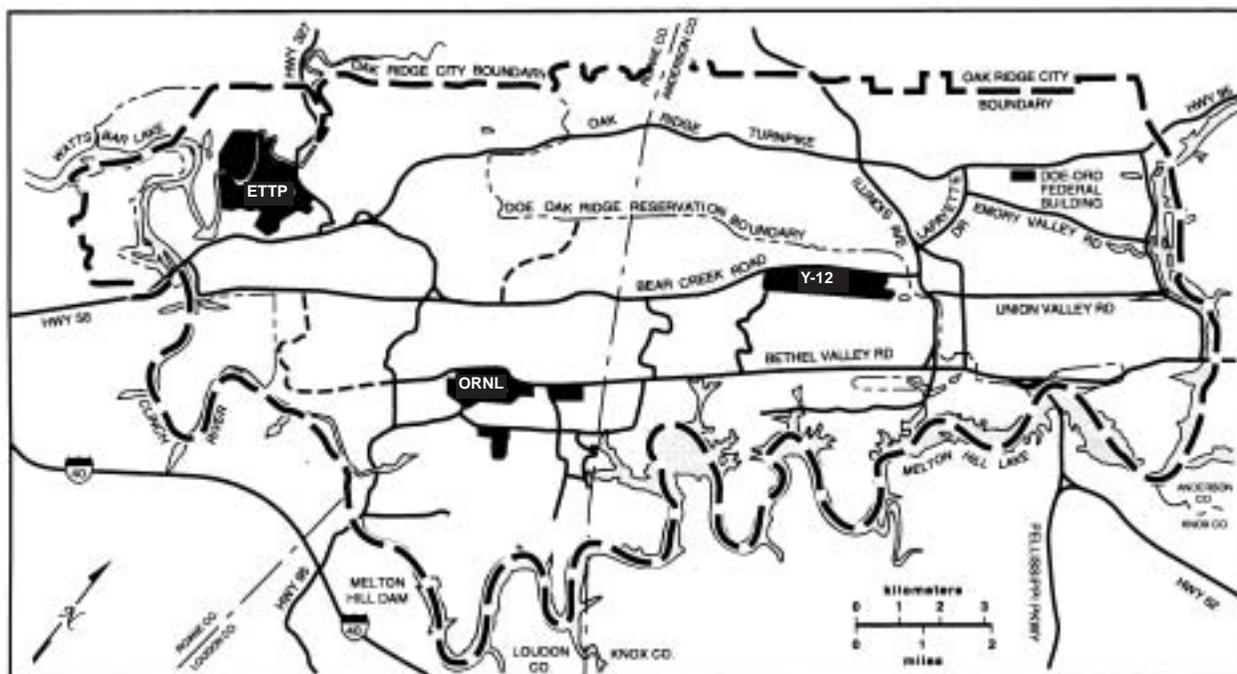
Groundwater management strategies must be determined as source cleanups are completed.

1.0 Introduction

1.1 HISTORY OF THE PROBLEM

Oak Ridge, Tennessee, was created to support the Manhattan Project, the secret World War II effort to develop the atomic bomb. The plants and town site were carved out of Appalachian valleys and ridges in 1942. After the end of the war, plant research and production supported the arms buildup associated with the Cold War. The U.S. Department of Energy (DOE) and its predecessor agencies left a legacy of buildings, lands and streams contaminated by radioactive and hazardous wastes. Especially in the early years, toxic and radioactive materials washed down streams and were released into the air from government lands. Wastes were later placed in long-term storage, where much still remains, yet to be properly tested and disposed of.

Three major industrial complexes remain on the Oak Ridge Reservation (ORR)—the Y-12 National Security Complex (formerly known as the Y-12 Plant), East Tennessee Technology Park (ETTP, formerly known as the K-25 Site and as the Oak Ridge Gaseous Diffusion Plant), and Oak Ridge National Laboratory (ORNL, formerly known as X-10). The missions of these facilities have changed over the years, but they continue to produce radioactive and hazardous wastes and to discharge small amounts of these



The Oak Ridge Reservation lies about 20 miles west of Knoxville and straddles Roane and Anderson Counties. Map courtesy of U.S. Department of Energy (Oak Ridge Reservation Annual Site Environmental Report for 1998, DOE/ORO/2091).

1.0 Introduction

substances into the environment. These activities are now regulated under federal and state laws and permits.

During World War II, Y-12 enriched uranium using an electromagnetic process; this process turned out to be relatively inefficient and was ultimately abandoned in favor of



TDEC photo

Jones Church is a historic structure predating the ORR.

gaseous diffusion. Y-12 then became the center for precision machining of special nuclear materials for nuclear weapons manufacturing. Y-12 now refurbishes and disassembles nuclear weapons and is the national repository for highly enriched uranium. It has also been designated the National Prototype Center in recognition of the unique expertise of its machinists.

K-25, the first gaseous diffusion plant, gave its name to the surrounding industrial complex. Now known as Horizon Center at ETTP, the complex ceased producing enriched uranium in the 1980s and refocused its mission on environmental management. Its current goal is to transfer reusable buildings to the private sector, a process known as “reindustrialization.” Those facilities that are too contaminated to renovate will be demolished. After

cleanup is complete, ETTP is to become the site for an industrial park. The Toxic Substances Control Act of 1976 (TSCA) Incinerator is also located at ETTP. This is the nation’s only facility permitted to incinerate radioactive waste mixed with hazardous waste containing polychlorinated biphenyls (PCBs), and it is key to cleanup of the ORR and other DOE sites. The TSCA Incinerator is scheduled to be decommissioned in 2006.

The X-10 plant originally pursued weapons research and development, and piloted the purification technique for plutonium production. Today, ORNL conducts research in a wide variety of scientific fields. It is famous for its contributions to neutron science and is the site of the Spallation Neutron Source (SNS), a major research facility nearing completion.

The story of Oak Ridge and details of the environmental damage caused by improper waste disposal are given in a community publication, *Oak Ridge, Tennessee: A Citizen’s Guide to the Environment*. This publication is available from the Oak Ridge Chamber of Commerce, or it can be downloaded from the following web sites: <http://www.local-oversight.org/>, <http://www.eteba.org/>, <http://www.orcc.org/intro.html>, and <http://www.eteconline.org/>.

1.0 Introduction

1.2 DIVISION OBJECTIVES

The Tennessee Department of Environment and Conservation (TDEC) formed a DOE Oversight Division (“the division”) in 1991 under the Tennessee Oversight Agreement (TOA). The division pursues five primary objectives:

- To monitor and effect DOE’s compliance with applicable laws, regulations, Oak Ridge Federal Facility Agreement (FFA) provisions, the TOA, DOE Orders, administrative policies, approved procedures, and appropriate guidelines;
- To evaluate the effectiveness of radiological controls implemented on the ORR by DOE and its contractors;
- To characterize and identify radiological and hazardous contaminants on the ORR and surrounding areas and to determine the potential impact of DOE activities on the welfare of Tennessee’s citizens and environment;
- To support DOE in employing the corrective measures necessary to provide a healthful environment for the citizens of the state; and
- To monitor contaminant releases under conditions of emergency response and provide requested services to the Tennessee Emergency Management Agency (TEMA) as described in its Multi-Jurisdictional Emergency Response Plan for the ORR.

Those facilities at ETPP that are too contaminated to renovate will be demolished.

The results of these activities and the current status of environmental health on the ORR are summarized in this report.

2.0 Jurisdiction

2.1 TENNESSEE OVERSIGHT AGREEMENT AND THE DOE OVERSIGHT DIVISION

The state of Tennessee and DOE signed the TOA in 1991. TDEC created the division the same year to carry out its responsibilities under the agreement. The TOA provides a framework and funding for the state to oversee DOE's effects on the community in four ways:

- A regulatory program to support state participation in the FFA (see Section 2.2 below);
- A non-regulatory program of independent environmental monitoring and oversight to supplement activities conducted under applicable environmental laws and regulations;
- An emergency response program to help ensure that the state and local communities are prepared in case DOE creates an off-site emergency; and
- An outreach program to increase public awareness and involvement by local governments and communities in DOE operations in Oak Ridge.

2.2 FEDERAL FACILITY AGREEMENT

The state, DOE and the U.S. Environmental Protection Agency (EPA) ratified the FFA in 1992. The FFA provides a legal framework for the division to enforce DOE's



Containers of low-level radioactive waste are visible from Highway 58 between ETTP and the Clinch River. The waste was initially discovered by the Tennessee Department of Transportation during road improvement activities.

remediation of contamination from past ORR activities. Oak Ridge has an FFA because the ORR is listed on the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) National Priorities List.

The division coordinates state activities under the FFA. The agreement itself outlines a procedure for cleanup on the reservation, including the identification of problems, scheduling of activities, and implementation and monitoring of appropriate

responses. Actions taken under the FFA conform to CERCLA, the Resource Conservation and Recovery Act of 1976 (RCRA), and other federal and state laws.

The National Environmental Policy Act of 1969 (NEPA) requires federal agencies to consider environmental impacts and provide for public review and comment on pro-

2.0 Jurisdiction

posed federal actions that could significantly affect the human environment. Although NEPA reviews are not required for projects performed under CERCLA, DOE is required to incorporate NEPA values (i.e., consideration of public input on potential impacts to the environment) into CERCLA actions.

CERCLA documents related to cleanup decisions on the ORR are available for the public to review at DOE's Information Center (see Section 7.4.4).

2.3 NATIONAL ENVIRONMENTAL POLICY ACT

NEPA requires federal agencies to implement policies and procedures to ensure that citizen participation and evaluation of environmental impacts are properly factored into the agency's decision-making processes.

The division commented on the following NEPA documents in fiscal year (FY) 2003:

- *Draft Environmental Assessment (EA) for the transfer of facilities and equipment to the United States Enrichment Corporation centrifuge research and development project at East Tennessee Technology Park, Oak Ridge, Tennessee.* The Finding of No Significant Impact (FONSI) was signed on October 18, 2002.
- *Draft EA for the proposed changes to the sanitary biosolids land application program on the Oak Ridge Reservation.* A FONSI for this EA was signed on February 16, 2003.
- *Draft EA addendum for the Proposed Title Transfer of Technology Park's Land and Facilities.* The final EA addendum and the FONSI are being finalized, and the document is now available.
- *Draft Environmental Impact Statement (EIS) for the Waste Management West Valley Demonstration Project Cattaraugus County, NY.* Comments on this EIS are still under review by DOE.
- *Draft EIS for the long-term management of the Defense National Stockpile Center excess elemental mercury.* DOE is analyzing comments on this EIS.

DOE Information Center
475 Oak Ridge Turnpike
Oak Ridge, TN 37830
Phone: (865) 241-4780
Fax: (865) 574-3521
Hours: 8 a.m. - 5 p.m.,
Monday–Friday

NEPA requires decisions to be made through a sustained process of inquiry, analysis and learning. It ensures that federal agencies provide the public an opportunity to learn about and comment on significant proposals. When followed as required, it ensures adequate planning and prevents costly mistakes.

NEPA documents related to federal decisions affecting the ORR are available for the public to review at DOE's Information Center (see Section 7.4.4).

2.0 Jurisdiction

ENVIRONMENTAL LAWS

Comprehensive Environmental Response, Compensation, and Liability Act of 1980

Commonly known as “Superfund,” CERCLA was enacted in 1980. It establishes a trust fund for cleaning up abandoned or uncontrolled hazardous waste sites. It also sets up rules governing these sites and holding those responsible for the contamination liable.

CERCLA lays out the steps through which DOE must proceed in cleanup planning under its environmental restoration program. The “CERCLA process” guides DOE through seven clearly defined steps:

- Planning,
- Investigation,
- Feasibility analysis,
- Development of alternatives,
- Public participation,
- Selection of alternatives, and
- Creation of a final, legal decision embodied in a document known as a Record of Decision (ROD).

The ROD is a key milestone in CERCLA decisions because it establishes the legal and technical requirements for a given cleanup. Once the state and EPA have signed a ROD, DOE is responsible for carrying out the actions outlined in the document. The ROD, and cleanup actions taken under it, are designed to ensure that all unacceptable risks to human health and the environment are eliminated or controlled as much as possible.

The state is responsible under the FFA for coordinating, reviewing, commenting on, and approving each phase of the CERCLA cleanup. The phases include remedial investigations, feasibility studies, RODs, remedial designs, remedial actions, and follow-up evaluations. These phases are present to ensure success of the cleanup. The FFA involves the state directly in program management, dispute resolution, project prioritization, and milestone scheduling.

Resource Conservation and Recovery Act of 1976

This law gives EPA authority to control hazardous waste from “cradle to grave.” It covers the generation, transportation, treatment, storage, and disposal of hazardous waste. It also provides a framework for managing non-hazardous wastes. RCRA focuses only on active and future facilities.

Continued on next page

2.0 Jurisdiction

Continued from previous page

DOE's waste management program must answer to the state's delegated authority under RCRA. The division does not enforce RCRA regulations, but it can and does document violations, which are then dealt with by TDEC's Division of Solid Waste Management.

National Environmental Policy Act of 1976

NEPA is the basic national charter for protection of the environment. It establishes policy, sets goals, and provides means for carrying out the policy. NEPA requires DOE and other federal agencies to provide public officials and citizens with environmental information for proposed federal actions that could affect the quality of the environment. With regard to major decisions regarding CERCLA activities, DOE has incorporated "NEPA values," including public participation and broad assessment of possible impacts, into the CERCLA process. The division's NEPA program reviews NEPA documents that pertain to DOE activities on the ORR.

Natural Resources Damage Assessment

The division also participates in Natural Resources Damage Assessment activities. Federal law authorizes this program, which gives natural resource trustees at the state and federal level a means of recovering environmental damages caused by releases from CERCLA sites. Specifically, the program is intended to address damages that cannot be effectively corrected through cleanup.

As of this writing, the state has negotiated with DOE regarding compensation for natural resources damages for Lower Watts Bar Reservoir. The negotiations have resulted in a partial settlement in the form of a permanent conservation easement on approximately 3000 acres of undeveloped ORR lands north of Horizon Center at ETPP.

Other Laws

Other laws applicable to environmental management at the ORR include the following:

- Clean Air Act (1970)
- Clean Water Act (1977)
- Emergency Planning and Community Right-to-Know Act (1986)
- Federal Hazardous Substance Act (1966)
- Federal Facility Compliance Act (1992)
- Safe Dam Act (1973)
- Safe Drinking Water Act (1974)
- Solid Waste Disposal Act (1965)
- Toxic Substances Control Act (1976).

2.0 Jurisdiction

2.4 OTHER PLANNING AND POLICY ISSUES

The division also reviewed and commented on the following document:

- *Draft Report: September 2001 sampling report for the Scarboro Community, Oak Ridge, Tennessee.*

2.5 NATURAL RESOURCE DAMAGE ASSESSMENT

On December 20, 2002, the governor of the state of Tennessee, the DOE's assistant secretary for environmental management and DOE's manager of Oak Ridge Operations signed an agreement in principle to work toward setting aside approximately 3000 acres of land on the ORR as a conservation easement. The conservation easement is to be managed in accordance with state laws addressing natural areas and wildlife management areas. The state agrees within this agreement in principle to credit DOE the value of this easement and the funding provided by DOE for management of the property, after consultation with the other NRD Trustees, toward any future claim for natural resource damage arising from DOE's activities on the ORR.

The conservation easement, the first of its kind in Tennessee for natural resource damages by DOE, is being pursued in response to natural resource damages at the Lower Watts Bar Reservoir. The easement is being developed through a joint effort by the state, DOE, the U.S. Fish and Wildlife Service and the Tennessee Valley Authority (TVA).

The state sponsored an open meeting in Oak Ridge in August to begin actively soliciting public input into the development of a resource management plan for the conservation area. Much valuable input has been received as a result of this meeting.



TDEC photo

Aster is one of the plants found on the 3000-acre conservation easement set aside in partial compensation for environmental damage under NRDA.

3.0 Environmental Management

3.1 RECENT PROGRESS

3.1.1 Environmental Restoration

Like last year, FY 2003 has been a very busy year for the Oak Ridge Environmental Restoration Program, and many activities have furthered environmental cleanup on the ORR. Major projects were completed involving huge quantities of contaminated soil, waste and/or sediment, which were disposed at the CERCLA waste disposal facility. Projects of note are

- Intermediate Holding Pond in Melton Valley,
- Bone Yard/Burn Yard at Y-12,
- K-1070A waste burial ground at ETTP, and
- Surface Impoundments Operable Unit (SIOU) at ORNL.

Each of these projects has contributed significantly to a reduction of environmental risk at Oak Ridge.

In addition to accomplishments over the past year, the Environmental Restoration Program continues to move forward with ongoing work in each of the major ORR watersheds:

In Melton Valley, work is in progress to isolate waste from the environment by capping the Solid Waste Storage Area (SWSA) 4 burial grounds. This is in conjunction with the construction of subsurface water intercept drains above and below the contamination.

At the Y-12 National Security Complex, design work is under way that will lead to the capture and treatment of approximately 500,000 gallons of mercury-contaminated water each day.

At ETTP, major decontamination and demolition activities are under way to remove old facilities remaining from the uranium enrichment activities at the site. The ongoing demolition of the K-29, K-31 and K-33 buildings, coupled with the beginning of demolition at the K-25 and K-27 buildings, will result in one of the largest demolition projects ever undertaken at any DOE site. These large gaseous diffusion facilities collectively cover more than 150 acres under roof and contain thousands of tons of contaminated process equipment.



TDEC photo
Remediation activity is nearing completion at the Intermediate Holding Pond site in Melton Valley.

3.0 Environmental Management

These activities, along with many smaller but significant cleanup projects, will keep the Environmental Restoration Program busy over the upcoming year.

3.1.2 Accelerated Cleanup Plan

The Oak Ridge Accelerated Cleanup Plan, which was agreed upon by the state, DOE and EPA in June 2002, is now under way. The plan accelerates the completion of



This waste disposal area in Melton Valley is covered by a temporary cap that will be replaced with a permanent remedy under the Accelerated Cleanup Plan.

cleanup at ETTP to 2008, the completion of the Melton Valley Interim Record of Decision (ROD) to 2006, and the disposal of all low-level legacy waste to 2005. It was put in place primarily to reduce long-term cost and to expedite remediation of the most contaminated sites on the ORR. The accelerated plan is a large undertaking that demands a sincere commitment by DOE and the U.S.

Congress to assure adequate funding. While Tennessee remains committed to the accelerated plan, the division is concerned that adequate funding may not be forthcoming. Although only one year into the plan, DOE is already seeing the need to delay milestones agreed upon within the FFA. If this trend continues, it is most probable that the plan will not meet its objectives.

Melton Valley Interim Record of Decision. The Melton Valley Interim ROD includes most of the sites grouped in the Melton Valley portion of White Oak Creek Watershed and a few projects from Bethel Valley (Section 3.2).

East Tennessee Technology Park Closure Project. The ETTP Closure Project will concentrate on extensive decontamination and decommissioning (D&D) of the massive gaseous diffusion plants and their support facilities, allowing cleanup of underlying soils. All actions under the ETTP Watershed (Section 3.4) will be part of this project.

Balance of Program. The Balance of Program includes remediation at Y-12 (see Section 3.3), which encompasses both the Upper East Fork Poplar Creek and Bear Creek Valley watersheds; actions at ORNL (Section 3.2) in the Bethel Valley portion of White Oak Creek Watershed off-site closures at sites in Oak Ridge and Knoxville; and waste management activities (Section 3.5).

3.0 Environmental Management

3.2 OAK RIDGE NATIONAL LABORATORY

3.2.1 White Oak Creek Watershed–Bethel Valley

The 800-acre Bethel Valley Watershed contains the main plant area of ORNL. The watershed is bounded to the south by the White Oak Creek Watershed–Melton Valley and to the north by the Bear Creek Valley Watershed.

This watershed contains the area previously known as Waste Area Grouping (WAG) 1: industrial buildings, laboratories, research reactors, and support facilities such as tank systems, pipelines, and other ancillary equipment. The wastes located in the Bethel Valley portion of the watershed came from operations such as the following:

- nuclear reactors;
- radioisotope operations;
- particle accelerators;
- hot cell operations;
- physical, chemical, and biological research;
- fuel chemical reprocessing research; and
- analytical laboratories.

Bethel Valley Watershed also contains the WAG 3 Burial Grounds to the west and the WAG 17 Shop Area. WAG 3 and WAG 17 are not as seriously contaminated as other areas but still must be closed out.

Bethel Valley Interim Record of Decision. The Bethel Valley Interim ROD was completed and signed by the FFA parties in May 2002. This ROD covers cleanup of surface water, soils, buildings, and contaminated source areas, while deferring decisions on groundwater to a later date. The signing of this ROD is a milestone and begins several years of CERCLA remediation within the Bethel Valley Watershed.

The Bethel Valley ROD defers decisions on groundwater cleanup to a later date.

The Molten Salt Reactor Experiment. The Molten Salt Reactor Experiment (MSRE) operated from 1965 to 1969, after which it was mothballed. The remediation and closure of the MSRE facility is still under way. This activity, authorized under a CERCLA ROD, involves the removal and disposition of reactor fuels (solidified salts of uranium fluoride and small amounts of plutonium fluoride). This material is scheduled for removal by FY 2005.

The following MSRE activities, overseen by the division's Environmental Restoration and Radiological Monitoring and Oversight programs, have taken place in FY 2003:

Reactive Gas Removal. DOE initiated this action to purge uranium hexafluoride (UF₆) and fluorine gas from the off-gas piping system. To date, the Reactive Gas

3.0 Environmental Management

Removal System has removed more than 61 percent of the UF_6 . This system will remain operational for the duration of the MSRE remediation project. Only small amounts of UF_6 were removed from the system during FY 2003.

Uranium Deposit Removal. The uranium deposit, which was removed in FY 2001 from the auxiliary charcoal bed, contains approximately 2.7 kg of uranium-233. The removal action report for this activity was completed and approved in FY 2002. The uranium deposit is currently being stored in a shielded cask in the MSRE reactor high bay pending final disposition decisions.

Fuel and Flush Salt Removal. This remedial action addresses removing the fuel and flush salts from the drain tanks, separating out the uranium, converting the uranium to an oxide form, storing the oxide as part of the uranium-233 repository inventory, and stabilizing and storing the residual salt. DOE, however, is evaluating the possibility of downblending all of the uranium-233 removed from MSRE with depleted uranium and subsequently disposing the material rather than converting it to an oxide. If this path is chosen, the Record of Decision for Interim Action to Remove Fuel and Flush Salts from the MSRE, the Work Plan for the Conversion of Uranium-Containing Materials Removed from the Molten Salt Reactor, and other applicable documents will require amending.

The schedule for the above activities has been delayed; therefore, the completion of the MSRE Remedial Action Report (now being called the Phased Construction Completion Report) is being delayed to FY 2005.

ORNL Corehole 8 Source Removal. This site is a plume of groundwater contaminated with strontium-90. The contamination can be traced back to highly contaminated soils and a leaking liquid low-level radioactive waste tank located in the main ORNL plant area. After excavation of approximately 90 percent of the contaminated soil around leaking underground waste tank W-1A, DOE discontinued the excavation activities. The project was delayed when excavation encountered higher-than-anticipated levels of transuranic (TRU) radionuclides. The state and EPA have subsequently agreed for DOE to rethink the excavation and disposal process and then expediently continue with the removal of this high-risk source. DOE has agreed to the resumption and completion of this removal activity in FY 2005.

Contamination at the Corehole 8 plume can be traced to contaminated soils and a leaking waste tank.

Surface Impoundments Operable Unit. The removal of contaminated sediment and sludge from two large waste impoundments was recently completed at ORNL. The impoundments were used beginning in the 1940s to settle out untreated wastewater from laboratory operations prior to release of the water to White Oak Creek. This remedial activity generated more than 600 large bricks of contaminated sludge and cement. The treated waste forms are being disposed within the on-site CERCLA waste disposal facil-

3.0 Environmental Management

ity. The completion of this cleanup project eliminates a significant source of radioactive contaminants to White Oak Creek and the Clinch River.

Spallation Neutron Source. The SNS is an accelerator-based research facility being built on a 75-acre site on Chestnut Ridge between ORNL and Y-12. Construction of the \$1.4 billion facility began in December 1999, and it is scheduled for completion in 2006.

The division conducts periodic inspections of erosion and sediment controls at the SNS site. Staff reviewed the draft National Pollutant Discharge Elimination System (NPDES) permit for the SNS. Staff also reviewed the permit application to construct a central exhaust facility and the associated estimated radionuclide emissions.

3.2.2 White Oak Creek Watershed–Melton Valley

The White Oak Creek Watershed–Melton Valley occupies about 1,000 acres of land south of and downstream of the Bethel Valley portion of the White Oak Creek Watershed. Haw Ridge separates Melton Valley from Bethel Valley. The Clinch River borders Melton Valley on the west.

Melton Valley contains many acres of burial grounds, seepage pits, contaminated floodplains, and hydrofracture wastes, but the majority of disposal activities involved the use of shallow land burial. The wastes located in this watershed originated not only from local operations, but from other sites as well. Beginning in the mid-1950s, the Atomic Energy Commission designated ORNL's solid waste storage areas as the Southern Regional Burial Grounds. From 1955 to 1963, various off-site installations sent about 10 million cubic feet of solid waste containing radioactive and hazardous substances to be disposed of in this area.



Large “bricks” of solidified radioactive waste from Surface Impoundment B at ORNL await transport to the EMWMF for disposal.

TDEC photo

The Melton Valley Watershed has been divided into nine major areas of contamination: WAGs 2, 4, 5, 6, 7, 8, 9, 10 and 13. Problematic contaminants, many of which are discharging into the Clinch River via White Oak Creek, include cesium-137, cobalt-60, strontium-90, tritium, other radionuclides, TRU elements, and volatile organic compounds.

3.0 Environmental Management

Melton Valley Watershed Interim Record of Decision. The Melton Valley Interim ROD was completed and signed by the FFA parties in September 2000. This CERCLA decision combines all the waste units in Melton Valley into one ROD and consists of many independent subunits or operable units that involve soil excavations, the capping of waste disposal sites, demolition of old facilities, and the plugging and abandonment of numerous monitoring and hydrofracture wells. Remedial actions to be performed under this ROD are scheduled under the Accelerated Cleanup Plan to be completed in FY 2006. Several of the initial activities under this ROD were completed this past year, and new activities continue.

Intermediate Holding Pond Excavation. Adjacent to SWSA 4 and White Oak Creek in Melton Valley lies an area known as the Intermediate Holding Pond. During early operations at ORNL, liquid radioactive waste was pumped into the holding pond after initial treatment to allow the hottest radioactive components to decay in place. Waste that did not settle out and remain in the holding pond would flow downstream into the Clinch River. Recently completed excavation and disposal of the Intermediate Holding Pond sediments have removed more than 20,000 cubic yards of radioactive contaminants from the environment.

New Hydrofracture Facility D&D. The fieldwork for demolition of the surface structures at the New Hydrofracture Facility is now being performed as a CERCLA remedial activity. This project is part of the Melton Valley Interim ROD. The remedial action involves D&D of the New Hydrofracture building and other ancillary support systems. The action also involves the stabilization of low-level waste tank No. 13 sediments. Contaminated waste from this project is planned for disposal at the on-site CERCLA waste disposal facility. This project is on an aggressive schedule for demolition and waste disposal to be completed in September 2003.

Plugging of Abandoned Monitoring Wells. The 111 wells at the four hydrofracture sites in Melton Valley are currently being plugged and abandoned. A total of 101 wells have been completed, including the HF-1 and the HF-3 injection wells. Remaining work includes the plugging and abandonment of seven small-diameter wells and one multi-port well. The remaining injection wells to be completed are HF-2 and HF-4. Field activities are on an aggressive schedule and are scheduled for completion in September 2003.

High Flux Isotope Reactor and Radiochemical Engineering and Development Center. The High Flux Isotope Reactor (HFIR) and Radiochemical Engineering and Development Center (REDC) are active facilities used for research into the effects of neutron interaction with various materials and for the production of medical and industrial isotopes. Targets that have been irradiated at HFIR are then sent to REDC for isotope separation and subsequent packaging for shipment to the end user.

3.0 Environmental Management

In spring 2001, the division formed a HFIR/REDC Review Team to increase state oversight of the HFIR and REDC facilities. For 2003, the team concentrated on the following areas:

- HFIR upgrades (ongoing from previous years);
- Strontium-90-contaminated soil discovered upon excavation for a new building addition (continued from previous year);
- The Plutonium-238 Project, undertaken by HFIR and REDC;
- Staff-conducted field trips for review of the Plutonium-238 Production Project; and
- Staff-conducted field trips for general overview of the REDC facility.

The division also performs periodic reviews of NPDES and radiological discharges at HFIR.

3.3 Y-12 NATIONAL SECURITY COMPLEX

3.3.1 Upper East Fork Poplar Creek Watershed

Located between Pine Ridge and Chestnut Ridge, the Upper East Fork Poplar Creek Watershed includes the main Y-12 complex and its surrounding area. This watershed lies to the east of the Bear Creek Valley Watershed and has more than 70 known sources of contamination.

A groundwater plume contaminated with nitrates, uranium-238, and other radionuclides and metals underlies the central complex area. This plume originates from the S-3 Ponds (on the divide with Bear Creek Valley Watershed) and from other sources within the complex.

A groundwater plume contaminated with nitrates, uranium-238, and other radionuclides and metals underlies the central complex area.

The Upper East Fork Poplar Creek Phase I Interim ROD. The FFA parties signed this milestone document in May 2002. The Phase I ROD focuses on preventing contamination from moving away from source areas and on cleaning up concentrations of contamination. This strategy includes the installation of asphalt caps over mercury runoff areas, flushing of contaminated sediment from storm sewers, relining or replacement of storm sewers as needed in the west end mercury area, construction of mercury treatment facilities, removal of contaminated sediments in Upper East Fork Poplar Creek and Lake Reality, monitoring, and land-use controls. Later RODs will address additional contaminated soils and sediments, D&D of buildings, and groundwater.

3.0 Environmental Management

3.3.2 Bear Creek Valley Watershed

Bear Creek Valley begins at a low divide west of Y-12. The watershed historically was used for disposal of wastes generated by nuclear weapons manufacturing at the plant. The primary waste streams were machining remnants of metallic uranium, solvents, nitrates, shock-sensitive and explosive chemicals, and contaminated tools and equipment. These wastes were buried in pits, poured into holding ponds, and burned. Bear Creek Valley now hosts a state-of-the-art disposal facility—the Environmental Management Waste Management Facility (EMWMF)—for CERCLA waste cleaned up on the ORR.

Boneyard/Burnyard Remedial Actions. Excavation of contaminated soils and waste from the Boneyard/Burnyard CERCLA remedial action began in spring 2002 and was recently completed in spring 2003. Approximately 64,000 cubic yards of uranium-contaminated soil and debris was removed, packaged and disposed at the on-site CERCLA waste disposal facility during this remedial action. Monitoring results downstream in Bear Creek are already showing a significant improvement after the cleanup of this site.

3.4 EAST TENNESSEE TECHNOLOGY PARK WATERSHED

The ETTP Watershed occupies 4,600 acres, only about 1,000 of which has been affected by operations at the former K-25 site. The watershed is partially bordered on the west by the Clinch River, and its tributary Poplar Creek runs through the area.



A subcontractor employee performs maintenance on a UF₆ cylinder at ETTP. TDEC photo

Principal contaminants in the groundwater are volatile organic compounds, some radionuclides, and various types of metals. The most pervasive contaminants are trichloroethylene and technetium-99. Surface water contamination is not a major problem.

Various types of contamination can be found in both shallow soils and deeper soils. Shallow soils contain radionuclides, metals and organics that can be traced back to spills, overflows, building runoff and atmospheric releases. Petroleum products, volatile organic compounds and some radionuclides are found in the deeper soils. This contamination is the result of waste line leaks, tank leaks, and burial grounds.

ETTP Zone 1. The ETTP Zone 1 area consists of the K-901 building, Duct Island, the K-770 area, the Powerhouse area, the K-1007-P ponds, and peripheral areas outside

3.0 Environmental Management

of the main plant site, such as ED-3, the Contractors Spoil area, and Blair Road Quarry. Because few buildings and facilities currently exist in this section of ETTP, Zone 1 is considered to be the area easiest to remediate. Work at Zone 1 will help define the process for remediation of the main plant area of ETTP. During FY 2001, the FFA parties developed a proposed plan for remediation that would allow for unrestricted industrial land use in the area. The ROD for Zone 1 was signed in November 2002. The FFA parties are now finalizing the post-ROD documentation, such as waste handling plans and remedial designs. Under the accelerated schedule, work is to be completed on the Zone 1 area and across the entire ETTP site by FY 2008.

K-29, K-31, and K-33 Decommissioning and Decontamination. In August 1997, DOE signed a contract with British Nuclear Fuels LLC (BNFL) for the D&D of three large process buildings: K-29, K-31 and K-33. These buildings were a part of the DOE gaseous diffusion process to enrich uranium at Oak Ridge. D&D work began in July 1998 at the K-33 building with radioactive contaminant removal, waste storage, and metals recycling. Metals recycling was a major aspect of the D&D plan but was put on hold by DOE's nationwide moratorium on releasing potentially contaminated metals to the public domain. As a result of this moratorium, much metal previously planned for recycling is now being stored or disposed. The division has been overseeing this project since its beginning. To date, all the equipment dismantlement and removal work has been completed in building K-33. Decontamination of this building is now occurring, while equipment removal is proceeding in buildings K-31 and K-29. This project remains on schedule, with completion planned for FY 2004.

Dismantlement work in building K-33 has been completed with the exception of the Cold Recovery Room. The decontamination of floors and walls from floor to ceiling has begun.

More than 60 percent of the work in the last unit of building K-31 has been completed. All the dismantlement-related work in the building is to be completed by September 2003.

More than 80 percent of dismantlement work on the operations floor has been completed in building K-29. All dismantlement related work in the building is to be completed by December 2003. Converters and compressors from the building have been transferred to the D&D workshop in building K-33 for processing.

More than 136 million pounds of low-level waste has been removed and sent for disposal to Envirocare of Utah; more than 27 million pounds of waste has been shipped for disposal to the Nevada Test Site.

D&D of ETTP Building K-1200. Project contractor East Tennessee Materials and Energy Corp. (M&EC) is responsible for removing all former uranium processing equipment and classified materials from center and south bays of the building. Additionally, all transferable radioactive and classified contamination within the building is to be removed. Furthermore, in preparation for M&EC's Waste Treatment Center,

3.0 Environmental Management

all necessary maintenance on the leased areas of buildings K-1200, K-1052 and K-1052B is to be performed routinely. Work in the south bay is now more than 50 percent complete, with final completion set for sometime in June 2005. Disassembly work has begun on the centrifuge units.

D&D of ETTP Building K-1420. The D&D of building K-1420 began in FY 1999 at a projected cost of \$10 million. As of May 2000, the projected cost was \$12 million, and its projected completion date was early 2001. However, in December 2000 a contract dispute resulted in a suspension of all work on this project. At the time of suspension, the project was approximately 90 percent complete. As of June 30, 2003, the status of this project had not changed. Negotiations are ongoing between DOE and the bonding company. DOE is requesting the bonding company to complete contract performance.

K-1070-A Burial Ground. Excavation of the K-1070A waste burial ground at ETTP has now been completed. Approximately 21,000 cubic yards of contaminated soil and waste materials have now been safely removed, packaged and disposed within the on-site CERCLA waste disposal facility. This 3-acre facility is the first waste burial ground to be entirely removed at ORR. This activity was authorized in a CERCLA ROD and was necessary to prevent contaminants from continuing to pollute surface water and groundwater on and around the ETTP plant site.

K-25/K-27 D&D. Decontamination and demolition activities for the K-25 and K-27 gaseous diffusion process buildings at ETTP are being accomplished under CERCLA removal action authority. In order to complete ETTP closure by FY 2008, this project has been assigned a high priority within the recently developed Accelerated Cleanup

Since these facilities are Manhattan Project Signature Facilities, there is much interest in maintaining some portions for historic significance.

Plan Agreement. Buildings K-25 and K-27 were placed into operation in 1945 to enrich uranium through the gaseous diffusion process. The buildings have been permanently shut down since 1964. Since these facilities are the original gaseous diffusion facilities and are Manhattan Project Signature Facilities, there is much interest in maintaining some portions for historic significance. Decontamination and demolition activities are planned in three major phases: removal of hazardous materials such as asbestos, removal of process equipment, and demolition of the building structures. The first phase has now begun in building K-25, with the abatement of 22 of 54 units complete. Removed material is being disposed within the on-site CERCLA waste disposal facility. To date, approximately 6,525 cubic yard of waste has

been disposed from this facility. According to present schedules, this project will be completed by FY 2008.

Group II Buildings D&D Activities. The demolition of numerous contaminated and uncontaminated structures on the ETTP site is well under way. For contaminated structures, the activity is being accomplished using CERCLA removal action authority. The main plant building D&D project has removed 10 facilities. Demolition waste from this

3.0 Environmental Management

activity is being packaged and disposed at the Envirocare disposal facility in Utah, the Y-12 demolition landfill, and the on-site CERCLA waste disposal facility. Disposal pathways are chosen largely based on cost and ability to meet the waste acceptance criteria for the various facilities. This project is scheduled for completion in FY 2003. Additional phases of work will follow, including the K-1064 peninsula area D&D and the remaining facilities D&D project.

Uranium Hexafluoride. DOE stores approximately 7,000 cylinders of depleted UF₆ or its remnants at ETTP in several storage yards. The division's Radiological Monitoring and Oversight Program follows UF₆ management. Cylinder yards are evaluated in terms of risk to the public and the environment through field measurements and inspections.

The UF₆ Cylinder Yard Environmental Dosimeter Program provides a quarterly dose rate report for the UF₆ cylinders at ETTP to protect the public associated with these areas. Currently, 102 environmental dosimeters are placed around the cylinder yards. These dosimeters measure the dose of gamma radiation to a hypothetical person located at the monitoring station 24 hours a day for a year. In the worst case, the dose is as high as 9539 millirem (mrem), approximately 26.5 times natural background. This dose for an individual, although unrealistic, points to the high-dose areas that should be avoided or where caution should be maintained.

Division staff members review quarterly reports and information from the cylinder information database and make site visits to observe cylinder yard activities. As a result of DOE's ongoing maintenance operation, which is overseen by division personnel, the upgrade of the K-1066-J cylinder yard was completed in 2002 and 488 cylinders have been relocated to the yard, where they now are in compliance with storage requirements.

Nearly 500 empty 12-inch cylinders were shipped for disposal. Additionally, non-destructive assay testing and borescope examination has been completed on the remaining 12-inch, 30-inch and 48-inch cylinders that are to be shipped for disposal in 2003. DOE completed the goal of 4,125 annual inspections.

DOE plans to begin shipment of full depleted UF₆ cylinders to the Portsmouth Gaseous Diffusion Plant for conversion to a more stable form. Division staff reviewed transportation plans for those shipments. Additionally, division staff has made plans for audits and on-site inspections of cylinders at the time of shipping. An inspection check-list has been drafted for use in judging compliance to regulatory requirements.



TDEC photo
A division staff member monitors radiation levels at a gate near the 1066-F UF₆ cylinder yard at ETTP.

3.0 Environmental Management

TSCA Incinerator. This incinerator, located at ETTP, is designed to treat mixed waste and PCBs (“mixed” waste contains both radioactive and hazardous contamination). This is the only incinerator in the United States permitted to treat mixed waste contaminated with PCBs.

With the shutdown of DOE incinerators in Idaho and South Carolina, Oak Ridge Operations’ TSCA Incinerator has become a “one-of-a-kind” treatment option. Because sites elsewhere in the DOE complex may need access to this facility, accelerated cleanup plans call for the incinerator to remain operational until 2006, instead of closing in FY 2003.

With the shutdown of DOE incinerators in Idaho and South Carolina, the TSCA Incinerator has become a “one-of-a-kind” treatment option.

In FY 2003, the division’s Waste Management Program monitored the incinerator in a variety of ways. It conducted audits, reviewed plans, reviewed data to verify exactly what is fed to the incinerator, and reviewed technical data associated with off-site waste streams destined for the incinerator. The incinerator once again operated during the FY 2003 in compliance with its permits.

The incinerator will be going through modifications to comply with Maximum Achievable Control Technology (MACT) provisions that go into effect September 30, 2003. The incinerator waste tracking system will be reprogrammed for reporting the MACT data.

On April 30, 2003, the Department of Energy was served a Notice of Violation for noncompliance with its the RCRA/TSCA air permit. The notice cited noncompliance during a RCRA/TSCA Trial Burn performed on May 14-25, 2001, with the particulate emissions rate, the volatile organic compounds emissions rate, and the lead emissions rate listed in Permit Number 0324491. DOE has submitted a Proposed Schedule of Corrective Actions and has presented calculations challenging the Air Pollution Control Division’s findings. The dialogue is continuing.

3.5 WASTE MANAGEMENT

3.5.1 Oak Ridge Environmental Management Waste Management Facility

Also known as the CERCLA waste disposal facility, the EMWMF was constructed to dispose of the large volumes of contaminated waste generated by remedial actions on the ORR, a formidable and expensive disposal problem. Historically, there have been two options: package and ship the waste to out-of-state locations, or delay cleanup, leaving the waste in the environment.

The option of leaving contamination in place is not acceptable for most sites, especially those with future uses or those that may be sources of groundwater contamination.

3.0 Environmental Management

Shipping the vast quantities of contaminated soil and debris to disposal sites in the western United States is prohibitively expensive. The ORR has long needed an on-site waste disposal facility that is properly engineered and constructed.

DOE, EPA, members of the public, and the state—through the division’s Environmental Restoration Program—took part in the planning and decision-making that has authorized such a facility. The EMWMF is now up and operating and has received remedial action waste from several projects on the ORR.

Because of the nature of the contaminants being disposed, the EMWMF will have to be maintained essentially forever. In order to help in this endeavor and to accomplish surveillance and general maintenance, Tennessee has established a trust fund to which DOE makes annual allotments; these allotments will continue until the principal in the fund reaches \$14 million. The state plans to use revenue generated from the fund to provide surveillance and maintenance after final closure of the EMWMF. It should be recognized, however, that this fund would not cover all expenses necessary in the long term to keep this facility protective of human health and the environment. The federal government will remain responsible to assure this protectiveness as long as EMWMF contents remain a potential hazard.



TDEC photo
After heavy rains, water is ponded in a waste cell at the EMWMF.

The division has recently been very active in environmental oversight of the EMWMF. Because of unusual rain and, to some degree, a lack of adequate operational management, the facility has experienced surface-water and ground-water management problems. To date, none of the problems have caused environmental harm or violated state statutes. However, the problems are significant, and long-term remedies are being designed, with some already in place and others to be employed in the near term. The division will continue to provide environmental oversight of this facility. It is a high priority of the state that the EMWMF be properly operated and maintained in order to ensure long-term protectiveness.

3.0 Environmental Management

3.5.2 Solid Waste

The division, through its Waste Management Program, works to ensure that DOE adheres to provisions of RCRA (See Environmental Laws sidebar) and to state of Tennessee Solid Waste Disposal Regulations.

Oak Ridge Reservation Landfills. The principal process performed at the ORR landfills is the disposal of solid wastes, which must be non-hazardous, non-radioactive, and non-RCRA-regulated. DOE must use approved operations in receiving, compacting and covering waste.

The division performs a monthly audit of DOE's landfills on the ORR. It also reviews DOE practices to ensure that radioactive waste is not disposed in landfills at Y-12. Following is the FY 2003 waste summary report of waste deposition in the four ORR landfills now in use.

Waste Summary Report FY 2003	
Landfill No.	Volume (cubic yards)
IV	609
V	33,705
VI	919
VII	55,264

Industrial Waste Landfill IV. This industrial waste landfill operates as an approved Class II landfill in accordance with TDEC permit No. IDL-01-103-0075. Because it was opened prior to implementation of the current Class II requirement established in the TDEC Solid Waste Processing and Disposal Regulation, the eastern area does not require a leachate collection system or gas monitoring capabilities. However, it has a leachate collection system in place in the western area and a gas monitoring system. Landfill IV is a classified industrial landfill.

Industrial Waste Landfill V. Industrial Waste Landfill V is a Class II landfill permitted under TDEC permit No. IDL 01-103-0083. The landfill receives mostly sanitary and industrial waste generated at the plants. It does accept special waste approved by TDEC. This landfill does have a leachate collection system.

Construction/Demolition Landfill VI. Landfill VI is a Class IV landfill permitted under TDEC permit No. DML-01-103-0036. This landfill is used for the disposal of demolition/construction waste and certain other TDEC-approved waste having similar characteristics.

3.0 Environmental Management

Construction/Demolition Landfill VII. Landfill VII is a Class IV landfill permitted under TDEC permit No. DML-01-103-0045. This landfill is used for the disposal of demolition/construction waste and certain other TDEC-approved waste having similar characteristics.

In FY 2003, the division participated in the hazardous waste compliance evaluation inspection at ORNL, Y-12 and ETTP. As a result of this inspection, TDEC's Solid Waste Management Division issued a Notice of Violation to ORNL for violating several of Tennessee's hazardous waste management regulations.

3.5.3 Radioactive Waste Management

Low-Level Radioactive Waste. As of June 2003, the inventory of low-level legacy waste on the ORR was about 31,800 cubic meters. This does not include about 4,000 cubic meters of newly generated low-level waste in storage and approximately 3,900 cubic meters of grandfathered waste. "Grandfathered" waste refers to waste already in the possession of DOE generators. It is in various stages of characterization and is anticipated to be transferred to DOE's Environmental Management program.

The state of Tennessee is committed to working with DOE, and the Comprehensive Waste Disposition Plan for the ORR has been finalized. This plan is required under the Accelerated Cleanup Plan Agreement signed on June 18, 2002, and supplemented by a Letter of Intent signed on May 14, 2002. Under the accelerated cleanup agreement, DOE will dispose all legacy low-level waste inventories by the end of FY 2005. As of this report, a document was being finalized that provides a description of the strategy for characterization, including sorting and segregation, of the legacy waste that has accumulated on the ORR.

Spent Nuclear Fuel. The division, represented by the Radiological Monitoring and Oversight Program, follows all spent nuclear fuel (SNF) issues, including inventory, storage, retrieval from below-grade storage, repackaging for shipping, shipping-cask inspection, and all other transportation issues related to SNF shipping. DOE is in the process of shipping all SNF to locations outside of Tennessee. Progress in this effort is summarized below.

Except for HFIR SNF, all aluminum-clad SNF has already been shipped to the Savannah River Site in South Carolina.



Waste in drums and boxes is stored under cover in Melton Valley near SWSA 6.

TDEC photo

3.0 Environmental Management

Repackaging of all non-aluminum-clad SNF was completed between FY 2001 and FY 2003, and those packages were made ready for shipment to Idaho National Engineering and Environmental Laboratory. Final SNF shipping preparation was completed in late FY 2003, and mock fuel handling exercises were performed. Five shipments of SNF going to the Idaho laboratory are ready and scheduled for shipment during FY 2004. Division staff reviewed documentation and conducted several field trips in monitoring these activities.

The disposal location for MSRE fuel salts will be determined in future years.

3.5.4 Mixed Waste Site Treatment Plan

The Site Treatment Plan is a mixed waste management tool authorized through the Federal Facility Compliance Act. Mixed wastes have both hazardous and radiological constituents. The Site Treatment Plan is implemented through a TDEC commissioner's order because the hazardous constituents are regulated. This enforceability has usually

resulted in an effective work-off of inventories according to negotiated schedules. DOE is challenging the appropriateness of the TRU milestones in the Site Treatment Plan. The matter is being resolved per terms of the Site Treatment Plan.

DOE is about to start operations in a new Transuranic Radioactive Waste Treatment and Packaging Facility at ORNL.

TRU radioactive wastes have only one disposal option: the Waste Isolation Pilot Plant (WIPP) in New Mexico. Most issues occur with highly radioactive wastes that must be handled remotely. These wastes are called Remote Handled Transuranic Wastes. There have been delays in shipment of remote-handled wastes because DOE has not obtained the RCRA permit modification it needs from the state of New Mexico for the hazardous constituents. DOE is about to start

operations in a new Transuranic Radioactive Waste Treatment and Packaging Facility at ORNL. The facility treats and stabilizes hazardous constituents so that the waste meets disposal regulations. The facility is expected to start treating low-level waste in November of 2003.

3.5.5 FACILITY SURVEYS

Five decades of nuclear weapons research and development has left a legacy of contamination in the local and regional environment, including land and water ecosystems. Most of the radiological and chemical contaminants were released directly from buildings and other facilities on the ORR.

In an effort to document the nature and sources of contamination, and to characterize facilities in general, the division's Radiological Monitoring and Oversight section conducts a Facility Survey Program. The program documents each facility's operational history, physical condition, past release history, radioactive and chemical inventories, and potential for ongoing and future releases. Through confirmatory field visits and docu-

3.0 Environmental Management

ment reviews, the program also tracks demolition and construction activities on all three sites.

As facilities are examined, they are ranked according to their potential to impact the environment. Since 1994, the program has examined 168 facilities, 58 of which held a high potential for environmental impact. The program examined eight facilities in FY 2003 and found that five of these posed a relatively high potential for releasing contaminants to the environment.

In many cases, the potential for environmental release is dominated by degraded facility infrastructure such as underground waste lines, substandard pumps and tanks, and leaky roofs and ventilation ductwork. This is particularly true at ORNL, where many facilities were connected to an antiquated liquid low-level waste line system. Inactive facilities with PCB- and lead-containing paints that are no longer receiving adequate exterior or interior maintenance are also contributors to environmental releases.

Many facilities at ORNL were connected to an antiquated liquid low-level waste line system.

Facility concerns noted by TDEC are relayed to DOE, where corrective actions can be formulated. As DOE carries out corrective actions, facilities are removed from the division's list of high potential environmental release facilities. To date, corrective actions have removed 10 facilities from the list.

3.5.6 Verification of Surplus Materials Release

Division staff review radiological control procedures and ensure that DOE and its contractors follow agreed policies for release of materials to the public. Under this activity, staff from the Radiological Monitoring and Oversight Program review occurrence reports when radioactively contaminated materials are inadvertently released. In addition, staff members check public auctions for adherence to release policies and conduct spot radiological surveys. Surveys of public auction items were conducted for 17 public auctions by Y-12 Surplus Sales, ORNL Surplus Sales and ETTP Surplus Sales.

Scrap metal is also monitored under this program. An inspection tour was completed of the various scrap metal collection points at ORNL. Scrap metal from the collection points is combined into larger loads for transfer to the buyer under an annual sales contract. Similar inspections are planned for Y-12 and ETTP.

4.0 Regional Environment

Although pollutants released from the ORR have substantially decreased over the years, concerns have remained that emissions from current activities could pose a threat to public health and/or the environment. To help ensure that emissions from the ORR are identified and properly controlled, the TOA specifies that the state

- Perform independent oversight and evaluation of DOE's environmental monitoring programs;
- Monitor radiation on the ORR and environs, as necessary, to detect and characterize off-site contamination and human exposure; and
- Evaluate performance of on-site control measures to prevent releases to the environment.

In response to these requirements, the division has developed programs that provide independent monitoring of all media on and in the vicinity of the ORR and oversight of DOE monitoring and control systems. Designed with the cooperation of DOE and EPA, these programs were developed to complement and verify monitoring performed by DOE's contractors.

4.1 WATER QUALITY

More than 100 miles of surface streams and considerable (but unknown) quantities of groundwater in East Tennessee have been contaminated by activities on the ORR.

More than 100 miles of surface streams and considerable (but unknown) quantities of groundwater in East Tennessee have been contaminated by activities on the ORR. While effluents from process waste streams contribute to this contamination, much of the pollution found in waters on the ORR can be attributed to releases from antiquated and deteriorating waste disposal, transport, and storage facilities. To a large degree, these contaminants migrate to groundwater, where they are discharged to local streams and transported to the Clinch River. While ORR contaminants are diluted by the Clinch River, evidence of them can be found downstream to Watts Bar Dam and beyond.

Each of the division's program areas has specific responsibilities that contribute to protection of the state's water resources. These responsibilities include the oversight of DOE monitoring systems and independent monitoring as necessary to verify DOE data.

4.1.1 Drinking Water Supplies

The division continued to oversee maintenance and compliance activities for the water treatment and distribution systems serving DOE's Oak Ridge facilities. This work includes the following:

4.0 Oak Ridge Regional Environment

- Independent monitoring of residual chlorine levels;
- Oversight of cross-connection controls, water line repairs, and the general status of distribution systems; and
- Monitoring of the transition of water system operations from DOE to municipal or private contractor control.

The division did not detect any serious threats to worker or public safety. However, given the challenges present on the ORR—including burial grounds, contaminated soils, and contaminated groundwater—evaluation of the potable water distribution systems at the three plant sites remains an ongoing need. Noteworthy events include the following:

Oak Ridge National Laboratory. Work began in laying pipe for ORNL's water line replacement project. The project will upgrade fire protection water services for the 6000 area. The SNS drinking water system went into service. In April, division staff collected samples of drinking water from five buildings in the vicinity of Core Hole 8. This area contains extensive subsurface radiological contamination. The samples were analyzed for the presence of gross alpha, gross beta, gamma radionuclides, E. Coli, and Enterococcus. Radionuclide levels of the water samples did not differ significantly from background levels. The samples tested negative for E. Coli and Enterococcus.

Y-12 National Security Complex. During August 2003, state regulators held a sanitary inspection of the Y-12 drinking water distribution system. The system received approval with a score of 98.

East Tennessee Technology Park. Since 1998, Operations Management International, a private firm, has operated the ETTP water treatment plant and drinking water system under a contract with the Community Reuse Organization of East Tennessee, the site's landlord. In October, state regulators conducted a sanitary inspection of the treatment plant and distribution system and issued approval with a score of 100.

Environmental Radiation Ambient Monitoring System Drinking Water Program. Since the Clinch River serves as a raw water source for public water supplies in the area, these utilities can potentially be impacted by ORR releases of radioactive effluents. To address this possibility, the division arranged for area treatment facilities to be included in EPA's Environmental Radiation Ambient Monitoring System (ERAMS) drinking water program. This program monitors drinking water from public supplies near nuclear facilities throughout the nation. In the Oak Ridge program, EPA provides radiochemical analysis of drinking water samples collected by the division at five area water supplies. These utilities include the following:

- Kingston Water Treatment Plant,
- Gallaher (K-25) Water Treatment Plant,
- West Knox Utility,
- City of Oak Ridge (Y-12) Water Treatment Facility, and

4.0 Oak Ridge Regional Environment

- Anderson County Utility District.

When radionuclides carried by ORR streams enter the Clinch, their concentrations are lowered by the dilution provided by the river. With exceptions, the contaminant levels are further reduced in drinking water by conventional water treatment practices used by the local utilities. Consequently, the levels of radionuclides and other contaminants measured in the Clinch and at area water supplies are far below the concentrations reported for many of the ORR streams. Through June 2003, results from the ERAMS analysis have all been below applicable drinking water limits.

As in previous years, the results reported for tritium were higher for the Gallaher (K-25) plant than for the other facilities monitored in the program. This facility is the first treatment system downstream of White Oak Creek, which is the major contributor of radionuclides flowing from the ORR. While tritium results were higher at the Gallaher plant, they have all been well below the standard prescribed by the Safe Drinking Water Act.

4.1.2 Groundwater

The majority of groundwater located under the 85 percent of the ORR that has not been developed is debatably clean and should be protected. The status of the groundwater in and adjacent to the industrially developed areas is in general terms very poor or in danger of being degraded through plume expansion. In most cases where contaminated groundwater has migrated off-site, restrictions on groundwater use are communicated to non-DOE land users. The Clinch River ultimately dilutes many of the groundwater discharges from springs near watercourses on DOE property and TVA property.

Most of the groundwater under the ORR is debatably clean and should be protected.

The division's groundwater programs range from a review of DOE efforts to independent sampling. The division oversees the plugging and abandonment of monitoring wells on the ORR, samples off-site residential drinking water wells, and helps collect and evaluate data for DOE's Oak Ridge Environmental Information System. The division also reviews documents released by DOE under CERCLA, NEPA, and other programs that may influence groundwater cleanup or groundwater use decisions on the ORR.

The lack of approved state groundwater classification rules has complicated the cleanup process on the ORR. The use of groundwater classification has been delayed because Tennessee's comprehensive state groundwater protection program has not gained approval by EPA. The EPA will not recognize the promulgated classification procedure until the comprehensive state groundwater protection program is approved. The state's plan continues to be under consideration by EPA.

Y-12 National Security Complex. Groundwater is contaminated beneath the Y-12 plant site, with plumes extending both east and west. Groundwater in the vicinity of Y-12 contains metals (including mercury), solvents, and uranium. A carbon tetrachloride plume extends east of Y-12 off the reservation beneath Union Valley. The groundwater

4.0 Oak Ridge Regional Environment

plume west of Y-12 emanates from the former S-3 ponds and is joined by contaminants from disposal areas in Bear Creek. The S-3 ponds were closed with contaminants in place and produce a nitrate plume with significant amounts of uranium. Y-12's waste area in adjacent Bear Creek Valley contains uranium, PCBs, and solvents, some of which are present in secondary sources where these denser liquids sank deep in the cavernous bedrock below the water table.

Disposal sites on Chestnut Ridge are grouped with the Y-12 hydrogeologic regime. The groundwater plume beneath Chestnut Ridge can be detected in springs east of the reservation at the University of Tennessee Arboretum.

This year marked an end to dryer conditions for the most part, and many springs and seeps have returned to flow after several years of no flow. The most notable consequence predicted by the division groundwater staff is impacts on the CERCLA waste disposal facility in Bear Creek Valley. Water levels have come to within 2 feet of the liner system. DOE must provide an engineering solution to this groundwater elevation problem. The division will continue to measure groundwater elevations to verify that groundwater elevations are effectively lowered.

This year marked an end to dryer conditions for the most part, and many springs and seeps have returned to flow.

Oak Ridge National Laboratory. ORNL has significant groundwater contamination both under the main plant site and in Melton Valley. At ORNL, radionuclides contaminate groundwater in the main building area, with strontium-90 being the major concern. Groundwater beneath the ORNL maintenance facility contains solvents. Waste from ORNL operations disposed in adjacent Melton Valley includes tritium and many radionuclides, as well as chemicals from experiments. The South Campus Facility on the east end of Bethel Valley has a plume of solvents that have been detected in springs close to what is now city of Oak Ridge property.

East Tennessee Technology Park. ETTP has contamination under the main plant as well as at adjacent smaller sites. The groundwater plume is also discharging off the ORR, mainly through springs onto TVA property. Groundwater at ETTP has considerable quantities of solvents and measurable amounts of uranium and other radionuclides, such as technetium-99.

Residential Groundwater Sources. The division has altered residential well sampling protocol. Composite samples are being used to facilitate dose estimation and comparison to drinking water standards. These test results indicate that the water in these sources is not currently affected by DOE operations. Most homeowners interviewed are satisfied with groundwater quality, and the quality of water from these sources appears to be good.

Springs and Seeps. Sampling of springs and seeps has been ongoing since 1992. Samples are taken at different times of the year from the ORR and water sources off the reservation. Springs and seeps provide exit pathway monitoring points. Some of these

4.0 Oak Ridge Regional Environment

points are close to burial grounds, and others are some distance away. This program continues to look for new springs and seeps to sample. The division sampled approximately 30 springs in the spring of 2003. Due to increased rainfall, many springs could be sampled this spring and summer that were dry in previous years of drought.

Sampling of springs provides insight into how contaminants travel in groundwater. Springs in Bear Creek Valley downgradient from the Bear Creek burial grounds continue to be contaminated by radiochemical, metal and volatile organic constituents. Several springs at K-25, Y-12 and ORNL are impacted as well. Volatile organics, nitrates, and gross alpha and gross beta activity are the contaminants of greatest concern.

Two off-site springs east of Y-12 are of special interest because they represent direct pathways onto public areas. The University of Tennessee Arboretum spring “Bootlegger” did not show volatile compounds as it has in the past, possibly due to the diluting effects of high rainfall this spring. A Union Valley spring had elevated levels of volatile organic compounds. These springs have direct groundwater pathways from contaminated areas associated with Y-12.

Some springs at ETTP show elevated volatile organic compounds and radionuclides. ORNL springs during this sampling period did not have elevated levels, but some of these springs have in the past shown elevated levels of radionuclides.

The levels of the contaminants are low, with some exceptions near waste sites, and the general quality of the groundwater on the ORR is good. The fact that contaminants can still be measured at fair distances from some source terms, however, emphasizes the need to protect the remaining clean groundwater on the ORR from spreading contaminant plumes.

Plugging and Abandonment of Wells. There are more than 4,000 monitoring wells and borings on the ORR. This project consists of requesting and reviewing data on ORR wells that will be—or have been—plugged and abandoned. With the exception of RCRA and Underground Storage Tank regulations, the state has no specific regulations concerning the plugging and abandonment of monitoring wells unless it can be demonstrated that the wells are contributing to pollution. A total of 11 wells in 2002 and 55 in 2003 have been plugged at the ORNL hydrofracture site as part of the remediation of the hydrofracture project. Division staff have observed field activities and helped review plans for these projects.

***There are more than
4,000 monitoring wells
and borings on
the ORR.***

Underground Storage Tanks. The division conducts oversight of the underground storage tank program on the ORR. In FY 2003, the division tracked sites that have been integrated into the CERCLA cleanup program.

4.0 Oak Ridge Regional Environment

Groundwater Strategy. DOE is drafting a strategy to address remediation of the groundwater plumes. The following general topic areas for a strategy are being addressed: problem formulation, uncertainty management, technology choices and performance objectives, and stewardship.

The division would like to see the conceptual model of ORR groundwater updated to include the complexities of the geology. Aquifers in soluble carbonate rocks are widespread on the ORR. These areas have springs, sinkholes, caves, and crevices that collectively are termed “karst.” Karst aquifers transmit contaminants in a rapid and unpredictable manner, making it difficult to investigate and clean up groundwater. The flow of groundwater within the less permeable shale rocks needs to be reevaluated as well.

4.1.3 Surface Water

Surface Water Sampling. The division’s Environmental Monitoring and Compliance Program sampled surface water at 29 sites in FY 2003. Twenty-five of these sites have been chosen to detect contamination from DOE. The other four are located upstream from the ORR and serve to provide background data.

The sites were sampled twice in FY 2003, and results will be published in the April 2004 Annual Monitoring Report, available to the public from the division. Samples were analyzed, and the results were compared with Tennessee Water Quality Criteria, a state water quality standard published by TDEC and based on the Clean Water Act. The division has not observed substantial concentrations of pollutants coming from the reservation.

Although the state has found that White Oak Creek is not supporting its designated uses under the Water Quality Criteria, the creek does not alter the designated use of the Clinch River. This is because the Clinch is a much larger stream and, therefore, dilutes contaminants from White Oak Creek.

Bear Creek Uranium Study. Over the years, more than 40 million pounds of uranium has been disposed in Bear Creek Valley near the Y-12 complex. Deposited in ponds and shallow unlined trenches, the uranium and associated contaminants migrate to groundwater, discharge into small tributaries, and are transported to Bear Creek. In 2001, the division began collecting radiological samples and flow measurements along Bear Creek, its tributaries, and its associated springs. The data are being used for the following:

- To develop baseline information to help assess the success of remedial activities and the impact, if any, of new facilities or activities in the valley; and
- To gain a better understanding of the sources, transport, and fate of uranium in the waters of Bear Creek Valley.

Over the years, more than 40 million pounds of uranium has been disposed in Bear Creek Valley near the Y-12 complex.

4.0 Oak Ridge Regional Environment

Significant results to date include the following:

- Division staff discovered a contaminated seep in 2001 located on Bear Creek just upstream of North Tributary 5. Sampling results do not match known plumes, and the exact source of the pollutants is unknown.
- Remediation efforts begun in 2002 resulted in a significant drop in contaminants being carried to Bear Creek from the Boneyard/Burnyard disposal area in 2003, as seen by differences from the sampling results for 2001 and 2002.

The CERCLA waste disposal facility experienced water-management problems as a result of heavy rains. Slightly elevated levels of gross alpha, gross beta, and technitium-99 in nearby tributaries were due to effluents released from the facility. DOE monitoring of effluents also indicates water-borne contaminant problems during storm events. Fortunately, established criteria as identified through CERCLA have not been exceeded, and DOE contractors have since performed corrective measures.

4.1.4 Water Pollution Control

National Pollutant Discharge Elimination System Compliance. Division Waste Management staff monitored the various phases of the ORR wastewater treatment facilities' operations, their radiological effluents, their potential impacts to water quality standards both on and off the ORR, and their possible impacts to human health and the environment. The staff reviewed and evaluated monthly Discharge Monitoring Reports for reported noncompliance with NPDES permits for ETTP, ORNL, and Y-12. The official copies of these permits are held by the TDEC Division of Water Pollution Control. Radiological NPDES data as reported in Discharge Monitoring Reports was periodically reviewed and evaluated to determine the effectiveness of DOE's water pollution control program in protecting the waters of the state from radioactive contaminants.

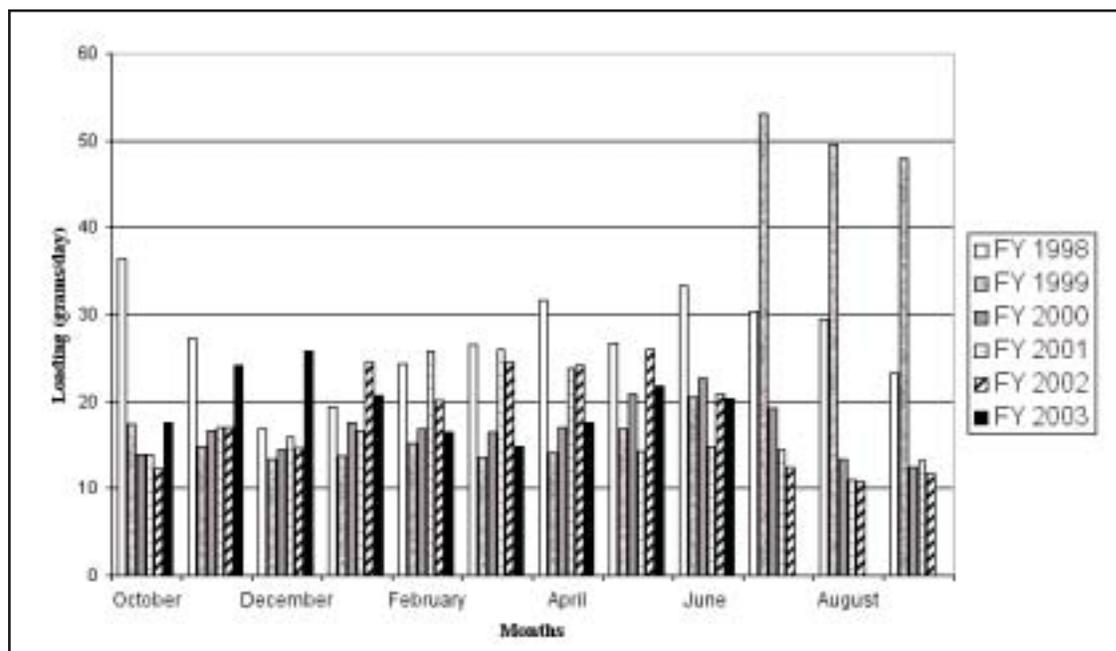
Division staff reviewed the ORNL Radiological Monitoring Plan Report for radiological discharges in May 2002. The division also reviewed radiological data collected at outfalls associated with the Operational Plan for the High-Flux Isotope Reactor (HFIR) for June 2002. Staff visited the HFIR facility to investigate an incident of uncovered radioactive strontium titanate, and they participated in meetings on the results of soil sampling at a HFIR construction area contaminated with strontium-90. The staff suggested that the outfalls' sampling frequency be increased.

Division staff coordinated with the Division of Water Pollution Control concerning the issuance of NPDES permits. Potential Radiological Monitoring Plan requirements were discussed. Staff communicated to DOE the division's preference for more comprehensive isotopic analyses.

Division staff accompanied EPA Region 4 personnel during a multi-media inspection of ORNL. No significant problems were noted from this inspection.

4.0 Oak Ridge Regional Environment

The staff continued to monitor levels of mercury in East Fork Poplar Creek at Station 17, which is at the Y-12 boundary (see Table). A 1999 TDEC Consent Order mandates management of mercury concentrations in East Fork Poplar Creek. DOE has been unable to achieve an interim guideline of 5 grams per day (averaged over 3 months).



Mercury loadings for East Fork Poplar Creek at Station 17, October 1997–June 2003. The consent order guideline is 5 grams/day.

Aquatic Resource Alteration Permits and Wetlands Protection. The division assisted DOE and the state Water Pollution Control Division Knoxville Environmental Assistance Center in review of Aquatic Resource Alteration Permits for the ORNL and ETTP projects. The division's involvement and recommendations, including site visits and CERCLA documentation review, facilitated and streamlined permitting decisions. The official copies of the permits are held by the Water Pollution Control Division.

Division staff performed inspections of erosion and sediment control practices for new construction sites on the ORR, including the SNS and the ORNL Campus Upgrade projects. This activity included inspection of a utility crossing, stream restoration of White Oak Creek, and periodic inspections of the flushing of highly chlorinated water from newly installed water lines. DOE has addressed sediment control problems to minimize adverse impacts on state waters.

In addition, division staff performed inspections of erosion and sediment control practices for new construction sites at the Horizon Center. Improper erosion control measures at several locations were noted and communicated to DOE and the state Water Pollution Control Division, Knoxville Environmental Assistance Center.

4.0 Oak Ridge Regional Environment

Biosolids Application Program. This program is an agreement between DOE and the city of Oak Ridge to allow the city to spread sludge from the sewage treatment plant on ORR property. In FY 2003, division staff attended meetings with DOE, the city and

DOE contractors, and reviewed analytical data to increase allowable radionuclide and heavy metals soil loading rates. No potential impacts were noted to water quality on and off the ORR or to human health and the environment. The division reviewed and provided comments to DOE on the Draft Environmental Assessment for the Proposed Changes to the Sanitary Biosolids Land Application Program on the ORR.



TDEC photo
Construction at the Spallation Neutron Source is a potential source of contaminated runoff. This activity is monitored by division staff.

Toxicity Biomonitoring. The division did not perform independent toxicity biomonitoring tests of DOE discharges in 2002 and 2003. The division did, however, review the “Biological Monitoring Program Quarterly Progress Report” for ETTP and the draft DOE 2001 Annual Site Environmental Report.

ORNL’s toxicity test results from early FY 2003 confirmed that biomonitoring limits in the NPDES permit for the Sewage Treatment Plant were met in June 2002, following a permit exceedance in May. Division staff and DOE personnel agreed on the NPDES permit requirements regarding the concentrations of effluent tested.

The results of DOE-performed testing indicated that the monitored outfalls at all three DOE sites complied with the biotoxicity conditions of their NPDES discharge permits.

4.2 AIR QUALITY

In the past, air emissions from DOE activities on the ORR have been suspected as a potential cause for illnesses affecting area residents. While airborne emissions have decreased with the termination of many historical operations on the ORR, current processes (e.g., incineration of radioactive wastes, production of radioisotopes, nuclear reactor operations, and remedial activities) continue to impact air quality. As a consequence, the division has developed air monitoring programs to assess the impact of ORR air emissions on the surrounding environment and the effectiveness of DOE controls and monitoring systems. Although the division has periodically measured fugitive releases from cleanup activities, these releases and permitted releases have not exceeded air quality criteria.

4.0 Oak Ridge Regional Environment

4.2.1 Ambient Air Monitoring for Radionuclides

To address the monitoring of radiological air emissions required by the TOA, the division has developed three integrated, but distinct, air monitoring programs. Together, the projects have placed nineteen air samplers at selected locations across the reservation. The Perimeter and Fugitive Air Programs focus on monitoring exit pathways, non-point sources of air emissions, and sites of special interest. The division's participation in EPA's ERAMS supplements the other two programs and provides independent verification of both state and DOE monitoring.

In addition to the above, the division is conducting a pilot study designed to assess the feasibility of monitoring radon emissions on the ORR. The project was prompted by a concern that the disposal of millions of pounds of uranium in ORR burial grounds may have resulted in elevated radon levels (radon is produced by the natural decay of radionuclides in the uranium decay series).

The division has developed three integrated, but distinct, air monitoring programs.

The Perimeter Air Monitoring Program. The Perimeter Air Monitoring Program uses 12 low-volume air samplers to monitor contaminants at locations believed to be the most likely exit pathways for airborne pollutants from the ORR. In previous years, data collected from the program has been relatively consistent with background measurements, given natural fluctuations expected in the quantities measured.

In 2002, short-term excursions above background levels were observed during January, March and December for monitoring stations located at Y-12. While the exact cause of the elevated results remains unknown, Y-12 is currently undergoing a program to modernize operational facilities and remove unneeded buildings. Either component of the program has the potential to have caused the slightly elevated results.

Fugitive Air Monitoring Program. The Fugitive Air Monitoring Program uses a portable high-volume air sampler to monitor diffuse (non-point) radiological emissions. Since the unit is mobile, the fugitive air sampler can be placed near locations where there appears to be a potential for the release of contaminants due to localized conditions (e.g., building demolition).

Since August 1999, the portable sampler has been stationed between the K-31 and K-33 process buildings at ETTP. Together, these facilities cover more than 47 acres and contain greater than 150 acres of floor space. During operations, the facilities were an integral part of the uranium enrichment process, and both are known to be contaminated with uranium isotopes, technetium-99, and TRU radionuclides. The facilities are currently being cleaned-up in association with DOE's Reindustrialization Initiative.

Prior to 2002, measurements taken at the process buildings consistently followed short-term trends recorded at the background station, but they were slightly higher than the background measurements. In the spring of 2002, staff noted an upward trend in

4.0 Oak Ridge Regional Environment

ETTP gross alpha results (when compared to the background values). These results also diverged from the short-term trends observed at the background station (i.e., the ETTP values increased while background data decreased), suggesting either an increase of emissions from the ETTP Process Facilities or an additional contribution to the levels measured from a new and unknown source.

In reviewing the anomalous data, it was noted the elevated values appeared to correlate with a resumption of work in the K-31 facility, work that had been suspended earlier in the year by DOE. After the DOE contractor responsible for cleanup of the facility was notified of the findings, the concentrations declined and were near background levels by the end of the year. Measurements taken from January through July of 2003 fluctuated from one to four times the background levels for both alpha and beta measurements. While the levels above background rose overall, the data indicates the dose levels remained below applicable limits (an annual average of 10 mrem above background concentrations).

EPA's Environmental Radiation Ambient Monitoring System. EPA's ERAMS program is composed of a national network of monitoring stations that regularly collect samples of air, water, and milk for radiochemical analysis. Historically, this network has been used to track environmental releases of radioactivity from nuclear weapons tests and nuclear accidents. In response to division requests and an initiative to incorporate site-specific monitoring into the program, EPA agreed to locate five of its air monitors on the ORR. These monitors have been in continuous operation since 1996.

The 2002 results for each of the five ERAMS monitoring stations were consistent with measurements taken at the background station, with one exception. This measurement was approximately four times the value reported for the remaining ERAMS stations and the background station during the same period. The sample was collected at the Bethel Valley ERAMS station, which is located just to the east of ORNL's main campus.

Available information indicates the elevated result was due to an accidental release of strontium-90 from the 3039 stack at ORNL. The release is reported to have occurred during the replacement of a high-efficiency particulate air filter on June 26 and 27, 2002. Details of the incident can be found in *Investigation Report of the Strontium Contamination Event at Oak Ridge National Laboratory, Oak Ridge, Tennessee*.

Radon Monitoring Pilot Project. As previously noted, radon is formed by the decay of radionuclides in the uranium decay chain. Since uranium was routinely disposed on the reservation, the division began a pilot study in 2001 designed to assess the need and feasibility of monitoring radon levels at ORR burial grounds. For this study, radon detectors were placed at background locations and over uncapped portions of the Bear Creek Burial Grounds, where more than 40 million pounds of uranium was disposed during operations. To capture radon released from the soils over the burial grounds, the detectors were attached to the inside of plastic 5-gallon buckets secured upside down at the sampling locations.

4.0 Oak Ridge Regional Environment

Initial results collected during the summer of 2001 indicated radon levels over the burial grounds could be measured and suggested that localized areas within the burial grounds had radon levels above background concentrations. Data received in 2003 indicated radon concentrations above background, but the concentrations measured were roughly an order of magnitude lower than those reported for 2001. The lower measurements are believed to be due to routine seasonal fluctuations and relatively high precipitation during the 2003 sampling period.

The object of the two pilot efforts was to demonstrate the feasibility of methods and materials. Winter has proven to be the best time for deploying the detection units, because vegetation and animals are not as much of a problem. Before the winter of 2003-2004, a statistical design and more careful geological characterization will be done to refine the test site coordinates and number and confirm that the location for background measurements is appropriate.

Radon in natural concentrations is found in indoor air. Radon-226 is believed to be a significant cause of lung cancer. As uranium-238 decays, a series of 13 radioactive daughter products—including radon-226—and stable lead-206 continue to accumulate over time. Because the Bear Creek Burial Grounds contain essentially pure uranium metal chips, it also contains significant quantities of other more active uranium isotopes with daughter products. Without removal of uranium from the burial grounds, more dangerous radioactive contaminants will accumulate over the very long term.

4.2.2 Ambient Gamma Monitoring (Oak Ridge Reservation Wide)

Gamma radiation is emitted by various radionuclides that have been produced, stored, and disposed on the ORR. Associated contaminants are evident in ORR facilities and the surrounding environment. To assess the risks posed by these contaminants, the division uses continuous gamma monitors and environmental dosimeters to measure radiation exposure rates and doses from external radiation at selected locations on and in the vicinity of the ORR.

The amount of radiation released by a facility is restricted by both state and federal regulations. While the limits on radiation exposures differ somewhat between the regulatory agencies, DOE, the Nuclear Regulatory Commission and the state all share a primary dose limit for members of the public of 100 millirem (mrem) per year. Since there are no agreed-upon levels where exposures to radiation are without risk, radiological facilities are also required to maintain exposures as low as reasonably achievable.

The public dose limit includes the dose from both external exposures (due primarily to gamma radiation) and internal exposures (due to ingestion, inhalation, injection, or absorption of radionuclides). The gamma monitoring programs address only external

Gamma radiation is emitted by various radionuclides that have been produced, stored, and disposed on the ORR.

4.0 Oak Ridge Regional Environment

exposures. Any contributions to the public dose from internal exposures would be in addition to the doses reported for the gamma monitoring programs.

The actual dose an individual receives at any given location from external sources of radiation depends on the intensity and duration of the exposure. The doses of radiation reported in the division's Ambient Gamma Monitoring Programs are based on the exposure an individual would receive if he remained at the monitoring station 24 hours a day for a year (8,760 hours). Since this is unlikely to be the actual case, the doses should be viewed as the maximum external dose an individual would be expected to receive at each location.

Gamma Monitoring using Environmental Dosimetry. Approximately 65 locations were monitored in 2003 using environmental dosimetry. The monitoring locations and associated results can be roughly organized into the three following categories.

Sites off the ORR. The doses reported for locations off the ORR (e.g., in residential areas) were all well below the 100 mrem dose limit for members of the public and to a large degree below the detection capabilities of the dosimeters (1 mrem).

Sites on the ORR Potentially Accessible to the Public. With the reindustrialization of portions of the ORR, there has been an influx of workers employed by businesses not directly associated with DOE operations. Since these workers are considered members of the general public, several of the sites within the boundaries of the ORR become problematic. For example, relatively high doses of radiation have been measured at ETTP in the vicinity of the UF6 cylinder storage yards (447 to 2,542 mrem in 2002). Under current conditions, these sites are considered by the division to be accessible to workers not employed by DOE or its contractors, and the state has continued to require the removal and/or stabilization of the cylinders.

Stations within Access Controlled Areas of the Reservation. Other sites monitored that reported results appreciably above the primary dose limit are currently located within access controlled areas of the reservation. These sites are subject to remediation in accordance with provisions of CERCLA and the FFA.

Gamma Monitoring using Continuous Exposure Rate Monitors. While environmental dosimeters provide the cumulative dose over the time period monitored, the results cannot account for the specific time, duration, and magnitude of fluctuations in the dose rates. Consequently, the dosimeters alone cannot distinguish a series of small releases from a single large release. The continuous exposure rate monitors record gamma radiation levels at short intervals (e.g., 1 minute), providing an exposure rate profile that can be correlated with activities or changing conditions at the site. The use of the monitors has been directed primarily toward areas or activities where exposure rates can be expected to fluctuate significantly over short periods of time or where there is a potential for the accidental release of radioactive contaminants.

4.0 Oak Ridge Regional Environment

In 2002, the exposure rate monitors were placed at a background location (Fort Loudoun Dam), Y-12's Industrial Landfill, Portal 4 at ETTP, two sites associated with the SIOU Remedial Action at ORNL (the 3513 Basin and a storage area for sediments removed from the basin), the Corehole 8 Plume Source Removal Action at ORNL, and the weigh-in station for the recently opened CERCLA waste disposal facility.

The SIOU Remedial Action. ORNL's 3513 Waste Holding Basin is included in the on-going SIOU Remedial Action. From 1944 to 1976, this basin served as a settling pond for ORNL effluents prior to their release to White Oak Creek. Consequently, sediments in the basin have accumulated significant quantities of radioactive materials. A CERCLA ROD (signed September 24, 1997) provided for the removal and disposal of these sediments and those in the adjacent 3524 Equalization Basin.

Prior to remedial activities, it was noted that radiation from the contaminated sediments in the bottom of the impoundment was shielded by the water held in the basin, resulting in significant changes in the exposure rates measured as the water level fluctuated. For example, exposure rates at the basin rose considerably in 1999, when the water level was lowered to repair a seep in the berm that separates the impoundment from White Oak Creek. In contrast, the exposure rates at the impoundment substantially decreased in 2000 after the beginning of the remedial activities, due to the water level being maintained to reduce the exposure to workers at the site. The exposure levels rose again in both 2001 and 2002, as the more contaminated sediments were removed from the basin and the excavated sediments (no longer shielded by the water) accumulated in various storage areas, awaiting disposal.



TDEC photo
Surface Impoundment B, a settling pond for liquid radioactive waste, faced remediation this year.

The highest exposure rates measured with the monitors in 2002 were in the vicinity of a storage area for sediments taken from the basin. Dose rates at this location averaged approximately 1.73 mrem/hour. While not a DOE requirement, this value approaches limits specified by state and Nuclear Regulatory Commission regulations requiring their licensees to conduct operations in such a manner that the external dose in any unrestricted area not exceed 2.0 mrem in any one hour. In the first half of 2003, the sediments in storage were transported to the CERCLA waste disposal facility for disposal, the removal of sediments in the basin was completed, and DOE began filling in the impoundment, which will ultimately be capped.

4.0 Oak Ridge Regional Environment

The Corehole 8 Plume Source Removal Action. In addition to water, soils shield radiation emitted by contaminants beneath the ground surface. The highest exposure rates measured in 2001 were associated with the excavation of an underground storage tank (W-1A) and contaminated soils feeding the Corehole 8 groundwater plume at ORNL. While the monitoring station was located approximately 75 feet from the excavation, exposure rates increased 10-fold as the tank and associated contaminants were uncovered. In this case, contaminants included TRU wastes that exhibited much higher radioactivity than had been anticipated by DOE contractors. As a consequence, the excavated materials were replaced, lowering the exposure rates until alternate methods for handling the waste can be developed.

Portal 4, Y-12 Industrial Landfill, and the CERCLA Waste Disposal Facility. Once removed from a remedial site, radioactive wastes must be transported to a facility for final disposal. In 2002, three sites were monitored to assess exposure levels as trucks carrying waste moved past the monitoring stations. Results measured at Y-12's Industrial Landfill (where the disposal of radioactive wastes is prohibited) were indistinguishable from background measurements. At ETTP's Portal 4, exposure rates increased as radioactive materials were transported through the gate; however, the frequency and relatively short duration of the excursions resulted in average values very similar to background measurements. The highest peak exposure rates in this group were observed at the weigh-in station for the CERCLA waste disposal facility, although the averages were not excessive.

4.2.3 Air Pollution Control

Review of Permitted Air Emissions Sources. The division performed the annual audit for Y-12 and conducted periodic reviews of air permitting documentation for ETTP, ORNL and Y-12. A Notice of Violation was issued in April 2003 for a noncompliance recorded during the period of the May 2001 TSCA Incinerator Trial Burn. Also, the staff assessed certification testing for the newly installed nitrogen oxide monitors at the Y-12 Steam Plant. The certification testing was conducted in accordance with regulatory requirements. The staff accompanied EPA Region 4 personnel during a multi-media inspection of ORNL. No significant problems were noted during the field inspection. The staff was contacted concerning air emissions from BNFL. The division referred BNFL to the regulating authority and recommended that BNFL personnel obtain certification to conduct visual emission evaluations.

Oversight of Asbestos Management and Removal. The division continued oversight of asbestos management and removal on the ORR to ensure compliance with air pollution control and solid waste management regulations. Division waste management staff performed site visits to Y-12 to monitor progress on ongoing D&D projects that involved asbestos-containing material. The staff reviewed special waste approval requests for the disposal of the asbestos-containing waste material in the Y-12 Industrial Landfill and visited the Y-12 landfill to ascertain DOE contractors' adherence to procedures for disposal of asbestos waste. Asbestos removals were ongoing with appropriate

4.0 Oak Ridge Regional Environment

methods, and removed asbestos was kept and disposed in a proper manner. No releases were noted.

Hazardous Air Pollutants Metals Monitoring. In 1997, the division established an independent monitoring effort to identify overall levels of hazardous pollutants in the air on and around ETTP. The division established comparable air monitoring programs at ORNL and Y-12 in calendar year 1999. High-volume samplers are operated at these sites, and samples are collected and analyzed at the state environmental laboratory in Nashville for the following selected heavy metals: arsenic, beryllium, cadmium, chromium, lead, nickel, and uranium as a metal.

The results of the FY 2003 monitoring campaign conducted by TDEC at the ORR sites indicate no apparent elevated levels of hazardous air pollutant metals of concern. Analyses for all metals of concern were below guidelines or the detection limits of laboratory analysis. It should also be noted that other incinerator facilities are in the vicinity of the ORR. The possibility exists that these operations, along with the TVA Bull Run Steam Plant facility on Edgemoor Road and the Kingston Steam Plant, could have an impact on ambient air quality around the ORR.

4.3 SOIL AND SEDIMENT QUALITY

4.3.1 Sediment

The division's Environmental Monitoring and Compliance Program samples sediments at 34 sites, 11 of which are located on the Clinch River and two on the Tennessee River. The other 21 sites are located on tributaries of the Clinch River draining from the ORR; these are considered "exit pathways." None are on a stream, such as White Oak Creek or Poplar Creek, that has already been identified as contaminated and that is currently monitored by DOE.

Samples were analyzed for organic, inorganic, and radiological contaminants. The results were compared with standards, known as Preliminary Remediation Goals, established for the ORR based on guidance from EPA. These standards were used because there are no regulatory guidelines for sediment quality, either at the state or federal level. The sediments met the standards for recreational use, meaning that people can safely engage in activities such as fishing, hiking, and playing at these locations.

4.3.2 Radiological Field Surveys

Division staff returned to the 44 sites listed in Appendix I of the FFA to reinvestigate and determine if requested maintenance had been



TDEC photo
Division staff perform benthic sampling to support the Rapid Bioassessment Protocol Project.

4.0 Oak Ridge Regional Environment

carried out by DOE. Essentially, no action has been taken to address the sites of concern. Therefore, concerns by the division continue to be justified for (public) human health and the environment due to DOE's lack of response.

DOE appropriately addressed the new Solid Waste Management Unit sites discovered by the division. Each site was cordoned off with yellow and magenta rope (if it was radiologically contaminated), placarded or otherwise flagged, and added to the FFA Appendix C list.

Many of these sites are located in otherwise uncontaminated areas of the ORR. Removal of the materials would essentially return the areas to pristine conditions.

4.4 FOOD AND WILDLIFE QUALITY

4.4.1 Environmental Biomonitoring and Oversight

The ORNL Biological Monitoring and Abatement Program (BMAP), a joint program by DOE and its contractor, examines the effects of DOE-related activities on the ORR and the surrounding community by studying various organisms on land and in streams originating on the ORR. Studies include aquatic toxicity testing, bioaccumulation monitoring, the use of biological indicators, and in-stream ecological monitoring of fish and benthic macroinvertebrate communities. These projects help define the "overall health" of a system by assessing its biotic integrity, identifying possible sources of ecological damage, and determining the effectiveness of DOE remediation efforts. BMAP sampling efforts have established a large database of information spanning nearly 2 decades. BMAP oversight activities and independent sample monitoring by the division provide a means of assessing the integrity of results obtained and assessments made by BMAP personnel. They also provide an independent analysis of the sampling locations.

The Environmental Restoration Support Section of the Radiological Monitoring and Oversight Program continued with the independent biological monitoring project during FY 2003. The project involves sampling and monitoring of aquatic vegetation on the ORR using species such as watercress, mint, and bur-reed as bio-indicators of radiological and metals contamination (uptake or bioaccumulation) in groundwater. Green algae samples have also been collected and analyzed. Habitats monitored included springs, seeps, spring tributaries, and reference locations.

During FY 2003, 30 aquatic vegetation samples were collected and submitted to the TDEC environmental laboratory for analysis of metals, gamma radionuclides, gross alpha, and gross beta. Laboratory analysis from these samples has shown bioaccumulation of mainly beta-emitting radionuclides in watercress and green algae. These were not at levels to be a cause for concern. No highly elevated concentrations of heavy metal contaminants of concern have been reported in the laboratory analyses. However, low concentrations of zinc, lead, cobalt, nickel and chromium were found in several watercress and green algae samples.

4.0 Oak Ridge Regional Environment

4.4.2 Milk Sampling

The division's Environmental Monitoring and Compliance Program oversees DOE's milk sampling program for the areas surrounding the ORR. DOE/UT-Battelle contractors take samples of milk from two locations in the vicinity of the ORR and one background location in Maryville and analyze them for radiological contamination. The data shows that milk from the sampling area is not contaminated.

4.4.3 Vegetation Sampling

The division's Environmental Monitoring and Compliance Program oversees DOE's vegetable sampling program for areas around the ORR. DOE contractors purchase lettuce, tomatoes and turnips from area gardeners for radiological analysis. There are six sampling sites: three in Oak Ridge, one between Kingston and Oak Ridge, one between Lenoir City and Oak Ridge, and one in Claxton. The data shows no radiological contamination in the vegetables.

4.4.4 Fish

Division personnel conduct inspections annually of sign postings advising the public against fish consumption and water contact in waters that have been or could be impacted by DOE operations. The advisory posting program is part of a larger, more encompassing sign-posting and -inspection project coordinated by the TDEC Environmental Assistance Centers in Knoxville and Chattanooga.

The division focuses its efforts on waters within and surrounding the ORR. Areas of responsibility include Melton Hill Reservoir above Melton Hill Dam and Watts Bar Reservoir, including the Clinch River, Tennessee River, and Lower Tennessee River arms. The advisory postings include warnings against consumption of catfish, striped bass, and Cherokee bass (striped bass/white bass hybrid). Precautionary postings warn certain groups of individuals (children, pregnant women and nursing mothers) not to eat any of the listed fish. All others are warned to limit their consumption to about two meals per month. Fish included on precautionary signs are white bass, sauger, carp, smallmouth buffalo, and largemouth bass.

Posting inspections are also conducted along East Fork Poplar Creek from the Y-12 Bear Creek Road entrance to the point at which Oak Ridge Turnpike crosses the stream. Signs have been placed along this portion of East Fork Poplar Creek, effectively covering the residential areas of Oak Ridge. These postings warn against direct contact with the water due to contamination by E. coli bacteria.

The division conducted the 2003 annual sign posting inspection from late January to early February. Six of the 24 signs along Melton Hill Reservoir and six of the 38 signs along Watts Bar Reservoir were missing or defaced and required appropriate remedies.

Posting inspections are also conducted along East Fork Poplar Creek from the Y-12 Bear Creek Road entrance to the point at which Oak Ridge Turnpike crosses the stream.

4.0 Oak Ridge Regional Environment

Current Fish Advisories

Stream	County	Portion	Pollutant	Comments
East Tennessee				
Boone Reservoir	Sullivan, Washington	Entirety	PCBs, chlordane	Precautionary advisory for carp and catfish.*
Chattanooga Creek	Hamilton	Mouth to GA line	PCBs, chlordane	Fish should not be eaten. Avoid contact with water also.
E. Fork of Poplar Creek, incl. Poplar Creek embayment	Anderson, Roane	Mile 0.0-15.0	Mercury, PCBs	Fish should not be eaten. Avoid contact with water also.
Fort Loudon Reservoir	Loudon, Knox, Blount	Entirety (46 miles)	PCBs	Commerical fishing for catfish prohibited by TWRA. Catfish, largemouth bass over two pounds, or any largemouth bass from the Little River embayment should not be eaten.
Melton Hill Reservoir	Knox, Anderson	Entirety	PCBs	Catfish should not be eaten.
Nickajack Reservoir	Hamilton, Marion	Entirety	PCBs	Precautionary advisory for catfish.*
N. Fork Holston River	Sullivan, Hawkins	Mile 0.0-6.2	Mercury	Fish should not be eaten. Advisory goes to TN/VA line.
Pigeon River	Cocke	NC Line to Douglas Reservoir	Dioxin	Precautionary advisory for carp, catfish, and redbreast sunfish.*
Tellico Lake	Loudon, Monroe	Entirety	PCBs	Catfish should not be eaten.
Watts Bar Reservoir	Roane, Meigs, Rhea, Loudon	TN River portion	PCBs	Catfish, striped bass, hybrid striped bass, and white bass should not be eaten. Precautionary advisory* for sauger, carp, smallmouth buffalo, and largemouth bass.
Watts Bar Reservoir	Roane, Anderson	Clinch River arm	PCBs	Striped bass should not be eaten. Precautionary advisory for catfish and sauger.*
Middle Tennessee				
Woods Reservoir	Franklin	Entirety	PCBs	Catfish should not be eaten.
West Tennessee				
Loosahatchie River	Shelby	Mile 0.0-20.9	Chlordane	Fish should not be eaten.
McKellar Lake & Nonconnah Creek	Shelby	Mile 0.0-1.8	Chlordane	Fish should not be eaten. Advisory ends at Horn Lake Road bridge.
Mississippi River	Shelby	MS line to mile 745	Chlordane	Fish should not be eaten. Commerical fishing prohibited by TWRA.
Wolf River	Shelby	Mile 0.0-18.9	Chlordane	Fish should not be eaten.

* Precautionary Advisory: Children, pregnant women, and nursing mothers should not eat the fish species named. All other persons should limit consumption of the named species to one meal per month.

4.0 Oak Ridge Regional Environment

One of the 39 signs located along East Fork Poplar Creek was missing and required replacement.

TVA conducts an annual Community Assessment Project to evaluate the condition of reservoirs in the Tennessee River Valley. The division acquired largemouth bass from TVA at four locations around the ORR during the annual 2002 Community Assessment Project in order to compare results with those from other agencies and organizations. Tissue samples from these fish were analyzed for mercury, arsenic, PCBs, gross alpha, gross beta, and gamma radionuclides. The results from the largemouth bass study reasonably supported the current postings. Results, however, also indicate that more work should be done to accurately quantify PCB concentrations in largemouth bass tissue in both the Tennessee River and Clinch River. Accurate quantification of contaminants in tissue is difficult. Furthermore there are seasonal fluctuations in concentrations that result from the varying fat content of the fish.

4.4.5 Aquatic Life

During spring 2003, division personnel conducted oversight trips in conjunction with the annual ORNL BMAP fish and benthic macroinvertebrate sampling events. Established scientific protocols and accepted sampling field methods were followed. The division annually conducts an independent assessment of benthic macroinvertebrate communities at the same stream locations sampled by BMAP. In late April, division personnel collected benthic macroinvertebrate samples for laboratory and semi-quantitative analyses. The semi-quantitative results indicated that the study streams tended to show signs of biotic improvement, with increasing water quality downstream of DOE activities.

Samples for analysis were transported to the state's Central Laboratory in Nashville. Results will be published in the 2003 Environmental Monitoring Report. The results from the 2002 independent sampling event can be obtained from the 2002 Environmental Monitoring Report, available at the division office or at <http://www.state.tn.us/environment/doeo>.

4.4.6 White-Tailed Deer

Division personnel monitor results from the fall deer hunts conducted on the ORR. The annual deer hunts began in 1985 as a method of population control. The most prevalent contaminants found in the deer are cesium-137, a gamma emitter known to accumulate in body tissue, and strontium-90, a beta emitter known to accumulate in bone. Three hunts occurred in 2002, on October 19–20, November 9–10, and December 7–8. One of the 161 deer harvested during the October hunt was retained by state and federal personnel at the checking station along Bethel Valley Road due to internal radiological contamination. None of the 115 deer harvested during the November hunt were retained due to internal radiological contamination. The December hunt yielded 145 harvested deer, of which two were retained due to internal radiological contamination.

4.0 Oak Ridge Regional Environment

4.4.7 Canada Geese

Past studies conducted by ORNL personnel have shown that a small proportion of Canada Geese residing at ORNL may become contaminated. Consequently, an annual goose roundup is conducted at ORNL, locations near ETTP and Y-12, and other sites on the ORR. Geese are collected and scanned to determine if they are contaminated by radionuclides and other hazardous contaminants. Since 1991, this has been a cooperative project between the Tennessee Wildlife Resources Agency, DOE, BMAP teams, and division staff.



TDEC photo

Caged Canada geese at ORNL are waiting to be screened for radiation by the multi-agency project team.

The June 2003 goose roundup surveyed 202 geese, including 140 adults and 62 juveniles, from five locations on and around the ORR. All geese received a unique leg band and most adults received a neck collar if they did not already have one. Four individuals were sacrificed for tissue analysis and archiving. None of the captured geese contained levels of cesium-137 above the DOE administrative control level of 5 pCi/g. In fact, all captured geese had levels of cesium-137 below 1 pCi/g. This is a significant improvement over past years.

Since none of the captured geese had levels above the DOE administrative control level of 5 pCi/g, the division conducted no off-site sampling. Contaminated geese have never been found off the ORR.

4.4.8 Wild Turkey

Two managed weekend hunts on the ORR are open to the public annually. Since the managed turkey hunts began, only two turkeys have been retained due to radioactive contamination. Those turkeys were retained in 1997 and 2001 due to slightly elevated strontium readings. The administrative release criteria are 20 pCi/g for bone tissue and 5 pCi/g for whole body count. The annual turkey hunts were canceled in 2003 due to security concerns.

4.4.9 Threatened and Endangered Species

Division personnel conduct evaluations on threatened and endangered plant and animal species on the ORR in support of the TDEC Division of Natural Heritage. Field surveys are conducted and report documents are reviewed as needed. The division keeps an inventory of those plant and animal species that are on the state and EPA lists for surveillance.

5.0 Key Challenges

The following is a summary of key challenges facing DOE, the community, and the state.

5.1 GROUNDWATER MANAGEMENT STRATEGIES

The CERCLA remedial action strategy at Oak Ridge has long been to make cleanup decisions on sources of contaminants before addressing groundwater. Sources may be burial grounds, spill sites, leaking tanks, contaminated soils, etc. This strategy remains valid and is reflected in the types of RODs that have been put in place over the past decade. However, a difficult decision is left for the future: What is to be done about contaminated groundwater. Because of the complex geology and hydrology of the Oak Ridge site, the cleanup of contaminated groundwater is a daunting task. The present strategy is to attack sources first, then institute groundwater remedies specific to individual problems. In some cases groundwater can be remediated using traditional methods; in other cases new technologies will be applied. However, some problems may not have definitive solutions by the time decisions must be made. Some remedies may take many years to return groundwater to a safe usable condition. In this event, DOE must have adequate long-term stewardship and institutional controls in place to assure continued protectiveness to the environment and human health.

5.2 LONG-TERM STEWARDSHIP RESPONSIBILITIES

Contamination, both hazardous and radioactive, will remain on the ORR for many years, long after the cleanup program has come to a close. As a result, long-term risk to the public and the environment will remain unless active care and monitoring of this contamination is maintained. The state is requiring that DOE ensure adequate funding for this care, independent of annual appropriations from Congress. If it is to be effective, long-term stewardship must also be accompanied by improvements in record keeping, enforcement, surveillance, maintenance, monitoring and funding.

5.3 THE FEDERAL COMMITMENT

DOE, EPA Region 4 and the state have signed an Oak Ridge Accelerated Cleanup Plan Agreement. The agreement resolved an FFA dispute by providing enforceable milestones through FY 2005. The accelerated cleanup program will complete the closure of ETTP, undertake interim actions in Melton Valley to cap historical disposal sites and control the spread of contamination in the groundwater, and complete other high-risk projects on and off the ORR by 2008. The plan calls for all stored legacy waste from the Oak Ridge site to be disposed by 2005 and CERCLA cleanup at Oak Ridge to be completed by 2016. If this plan is successful, it is estimated to reduce cost by more than \$2 billion and accelerate completion of the Environmental Management Program by five years. Adequate annual funding is imperative to achieving agreed goals.

5.0 Key Challenges

Certain events since the signing of the Accelerated Cleanup Plan have brought the success of this program into question. The state, EPA and DOE have recently entered into an informal dispute under the FFA concerning DOE's inability to meet previously agreed-upon milestones. The state and EPA are awaiting the completion of DOE's new life-cycle baseline (long-term schedule and budget) to identify any potential problems to meeting the agreed-upon 2005, 2006 and 2008 deadlines. If the new baseline indicates that funding shortfalls will lead to a delay in meeting the objectives of the Accelerated Cleanup Plan, the formal dispute process under the FFA may be invoked.

Since the terrorist attacks of September 11, 2001, numerous formerly public documents, including environmental plans and reports, have been categorized as "Official Use Only" (OUO) due to security concerns. This has resulted in "redaction" of maps and references to strategic facilities or materials in versions certified as suitable for public release. The state does not hold records designated as OUO because it cannot, by law, keep them from public access. The state reviews OUO and classified documents in designated DOE facilities. If available, redacted copies are kept in state files. However, this increased security has limited access by the general public to important environmental information freely released in the past. This causes concern about maintaining effective public input into NEPA and CERCLA decisions.

5.4 CHARACTERIZATION AND DISPOSAL OF RADIOACTIVE WASTE

Among the obstacles to completing accelerated cleanup goals is the characterization and disposal of stored radioactive waste. DOE self-regulates radioactive waste, which is physically in the way of cleanup activities. Administratively, the accelerated plan cannot be considered finished until this waste is characterized and properly disposed. DOE must show a higher priority on this activity than it has in the past to achieve accelerated cleanup.

Over the years, stored wastes have continued to accumulate.

Waste with both radioactive and hazardous components is termed "mixed" waste. Although DOE is self-regulating in the area of radioactivity, states do regulate the hazardous constituents in wastes. Because Tennessee has this authority, it has been able to negotiate milestones and targets with DOE for characterization, treatment, and disposal of mixed low-level and mixed TRU wastes under the Federal Facilities Compliance Act Site Treatment Plan. Over the years, funding shortfalls and a lack of disposal options have made these schedules difficult to attain, and stored wastes have continued to accumulate.

The treatment and disposal of remote-handled TRU waste is of particular concern to the division. ORR has the largest inventory of this waste destined for disposal at WIPP in New Mexico of any DOE site. A permit from New Mexico officials allowing WIPP to accept remote-handled TRU waste has been delayed; as a result, the state and DOE have had to renegotiate Site Treatment Plan schedules for this waste in Oak Ridge. DOE has requested that the TRU waste milestones be removed from the Site Treatment Plan.

5.0 Key Challenges

TDEC has denied the request, and DOE has disputed the state’s decision. The matter remains under dispute. The Oak Ridge Reservation Local Oversight Committee (LOC, see Section 7.2) has sent a letter to the governor of Tennessee to see if he can help accelerate the New Mexico permitting process. WIPP is the only disposal site in the country designed for TRU wastes.

5.5 INCORPORATING HISTORIC PRESERVATION INTO CLEANUP ACTIVITIES

The ORR is home to three Manhattan Project-era plants designated by DOE as “Signature Facilities.” These are the Graphite Reactor at ORNL, the Beta 3 Calutron Racetrack at Y-12, and the K-25 Gaseous Diffusion Plant at ETTP. The Accelerated Cleanup Program includes plans for demolition of the K-25 building. Under pressure from stakeholders and the state, DOE has belatedly undertaken studies to assess how to best preserve and interpret the history, features, and artifacts of the K-25 plant. Other buildings in ORR historical districts have been or are slated for demolition.

Coordination with the Tennessee Historical Commission, an office of TDEC, ensures that the lessons of the Manhattan Project are not lost for future generations. Although environmentally hazardous facilities must be demolished and contaminated debris disposed of, selected artifacts will be preserved, and buildings will be photographed and documented.

5.6 IMPACTS OF THE ACCELERATED CLEANUP ON REINDUSTRIALIZATION

The reindustrialization initiative at ETTP was designed to promote reuse of suitable facilities by the private sector in order to offset the impact of a declining federal presence. Initially, the Community Reuse Organization of East Tennessee was to lease facilities from DOE and sublease them to businesses. Although all signed leases state clearly that the site is on the National Priorities List of CERCLA sites and the lessee may be asked to vacate the premises early due to cleanup schedules, there has yet to be suitable reconciliation between the desire for complete cleanup at ETTP and the preservation of viable firms that are dependent on specific facilities for their continued business.

With the new Accelerated Cleanup Plan, the vision for reindustrialization changed significantly. Now, all facilities at ETTP are scheduled for demolition. Only those facilities that are transferred to another owner prior to demolition will be available for reuse. Unfortunately, some of the facilities scheduled for demolition currently have tenants that require specific equipment or other features in their current locations. DOE has a process for private parties to purchase real estate at ETTP. Close coordination between accelerated cleanup efforts and reindustrialization is critical to assure the success of both programs.

6.0 Health Studies & Emergency Response

6.1 HEALTH STUDIES

Concerns have been raised for years concerning contaminants from the ORR and health problems they may have caused for workers on-site and for nearby residents.

Several government agencies have moved to address these concerns, through energy-related research, health-related studies, and public health activities centered on the ORR. These activities have been conducted by the National Center for Environmental Health, the National Institute for Occupational Safety and Health, the Agency for Toxic Substances and Disease Registry (ATSDR), the Centers for Disease Control and Prevention (CDC), and the Tennessee Department of Health.

Health studies and assessments already conducted or ongoing in Oak Ridge are grouped into three main areas:

- Off-site contamination,
- Community health studies and activities, and
- Workers health studies.

6.1.1 Oak Ridge Reservation Health Effects Subcommittee

ATSDR and other CDC agencies have established an Oak Ridge Reservation Health Effects Subcommittee (ORRHES) made up of a representative and knowledgeable group from the Oak Ridge area. The subcommittee is a federal advisory committee that provides advice and recommendations to CDC and ATSDR about the agencies' public health activities and research at the ORR. There have been numerous meetings, presentations, discussions, workgroup activities, and various completed and ongoing projects since ATSDR established the ORRHES in 1999. As ATSDR concludes its efforts, these activities should result in an increased local emphasis on environmental medicine. The health concerns of exposed individuals can be addressed through clinical intervention in combination with health education.

6.2 EMERGENCY RESPONSE

6.2.1 Tennessee Emergency Management Agency

TEMA is the state's emergency management arm. Located within the Military Department of Tennessee, TEMA provides technical assistance, supplies, equipment and training to local governments. The agency also administers funding from the state and federal governments.

6.0 Health Studies & Emergency Response

TEMA operates a 24-hour emergency operations center. This center manages emergency information and coordinates state and federal assistance from one location.

Under the TOA, DOE is required to provide technical and financial assistance for emergency response. TEMA is the primary state agency responsible for implementing the following provisions:

- Developing and maintaining the state’s Multi-Jurisdictional Emergency Response Plan for ORR facilities in accordance with federal laws and regulations;
- Organizing and participating in annual emergency response exercises and drills with affected state agencies and local governments;
- Training state and local government employees and officials, as well as volunteers who may be called upon in the event of an emergency at the ORR; and
- Acquiring and maintaining equipment—with funds provided by DOE—for TEMA and affected counties to support the Emergency Response Plan.

TEMA is responsible for emergency response planning and training, and the division actively participates in emergency response exercises on the ORR. The division, in coordination with TEMA, has developed a system to track occurrences sufficiently significant to be reported. Daily occurrence reports are sent to the division. The division is also in constant contact with TEMA through the use of a dedicated duty person and the use of a 24-hour paging system.

The division actively participates in emergency response exercises on the ORR.

The Multi-Jurisdictional Emergency Response Plan was finalized by TEMA in June 2002. This plan is shared with emergency response organizations in Anderson, Knox, Loudon and Roane counties. The basic plan describes general concepts that guide the off-site response to emergencies at the ORR. The purpose, scope and execution of the plan, as well as the state’s mission, assignment of emergency responsibilities, and descriptions of the major emergency response organizations are provided. The Emergency Support Function sections describe specific off-site response action resulting from an emergency at the ORR. For each function, the lead and support agencies are assigned and concept-of-operations and responsibilities for the tasked agencies are defined. Site-specific information is provided in appendices.

6.2.2 TDEC DOE Oversight Division

The division maintains a capability for responding to environmental emergencies and supports TEMA in technical issues that may result from DOE activities in Oak Ridge.

The division annually participates in a series of exercises in Oak Ridge. These exercises involve DOE, TEMA, and local agencies from Anderson, Knox, Loudon, and Roane counties.

6.0 Health Studies & Emergency Response

In an emergency or exercise, the division maintains and fully staffs the Environmental Monitoring Control Center and the Environmental Field Monitoring Teams. The Environmental Monitoring Control Center is located at TEMA-East in Alcoa, Tennessee. The Environmental Field Monitoring Teams are dispatched from Alcoa. In addition, the division supplies a staff member to the Field Coordination Center. The division also supplies a staff member to the Joint Information Center at the Lenoir City National Guard Armory.

In 2003, the division participated in a series of exercises at ETTP. In 2004, the annual exercise series is scheduled for Y-12.



TDEC photo

Contamination requires workers to wear personal protective equipment during demolition activities. Radioactive and hazardous chemicals can be spread into public areas and even workers' homes if contamination control is not maintained on workers and equipment.

7.0 Outreach

The division conducts public outreach at the local, state and national levels. By attending public meetings to make presentations and act as an information resource, the division helps the public learn about the ORR's environment. The division's local and state activities are included under the TOA. Its national activities include membership in a variety of programs and initiatives. The division also maintains a World Wide Web site with detailed information about ORR environmental issues at <http://www.state.tn.us/environment/doeo>.

Other community organizations that monitor DOE activities in Oak Ridge also seek to include the public in their work. In addition, DOE has an extensive outreach program to solicit public input on environmental concerns, and the agency has established two information centers to give stakeholders direct access to relevant documents.



The division hosts a demonstration on field analysis for mercury this spring. TDEC photo

Outreach programs enable the public to play a meaningful role in environmental decision-making. Following are the major public outreach efforts undertaken by a variety of organizations concerned with DOE's environmental management program at Oak Ridge. Contacts for local and state initiatives—including addresses, phone and fax numbers, and web sites—are listed in the appendix.

7.1 TDEC DOE OVERSIGHT DIVISION

7.1.1 Local Activities

One form of public outreach used by the division is to share knowledge and experience with local students. An Anderson County High School faculty member requested an address to students in environmental science and chemistry classes during the last school year. In response, division staff made presentations to two environmental science classes on air and water pollution and to a chemistry class on hazardous waste concerns. The presentations were well received by both students and faculty.

7.0 Outreach

7.1.2 National Activities

At the national level, division staff members participate in a wide range of initiatives that may affect the ORR, the Oak Ridge community, or the state. These initiatives include involvement in the following groups:

Interstate Technology and Regulatory Council. The Interstate Technology and Regulatory Council (ITRC) was formed in 1995 as a multi-state coalition working to achieve regulatory acceptance of innovative environmental technologies. The state-led ITRC became affiliated with the Environmental Council of States in 1999 and has been working closely with that organization to promoting the examination of innovative technology for conducting more cost-effective and efficient site cleanups. The Radiological Monitoring Section representative for the state has been working with ITRC to create cleanup levels for radionuclides in soils. A training workshop has been established on the Internet. In addition, the ITRC Radionuclides Section has been working to publish a guidance document on long-term stewardship to assist the states in this planning.

The National Governors Association Federal Facilities Task Force. The task force provides a forum for open and effective dialogue between DOE host states and DOE officials on their respective concerns and priorities. Developments and discussions at DOE Headquarters concerning the “Top-to-Bottom Review” of the Environmental Management Program and accelerated cleanup of the complex were the focus for FY 2003.

The National Conference of State Legislatures’ State and Tribal Government Working Group. The State and Tribal Government Working Group (STGWWG) is a forum in which all tribes affected by DOE sites can interact directly with the states and DOE. Major STGWWG interest areas for FY 2003 were long-term stewardship, tribal issues, transportation of cleanup waste, and the Rocky Flats Closure Project. STGWWG plays an important role in ensuring DOE’s consideration of state and tribal guidance during cleanup of the DOE Complex.

The Association of State and Territorial Solid Waste Management Officials Radiation Task Force. This organization tracks radiation-related issues that could affect EPA region states. The division represented the task force at a workshop at Nuclear Regulatory Commission headquarters on the disposition of radiactively contaminated solid materials. The task force gets regular updates, and provides comments to the U.S. Army Corps of Engineers, the Nuclear Regulatory Commission, and EPA. Important information is sent on to other divisions and states in EPA Region 4.

The Tri-State (Tennessee, Kentucky and Ohio)/DOE Depleted Uranium Hexafluoride Working Group. This group has meetings and weekly conference calls to work out details of the shipment of UF₆ cylinders from ETTP to Portsmouth Ohio. It has evolved from a small group of mid-level environmental managers to include a larger contingency of legal, policy, emergency response, law enforcement, and DOE UF₆ cylinder staff. The “nuts and bolts” of UF₆ transportation are being worked out. This group has existed since 1997.

7.0 Outreach

Division activities also include the following:

- Reviewing and commenting on DOE's Long-Term Stewardship Strategic Plan,
- Participating as Tennessee's representative during DOE complex-wide integration discussions of waste management and nuclear materials management plans involving inter-site disposition, and
- Publishing papers in national journals about environmental planning and radiation safety.

7.2 OAK RIDGE RESERVATION LOCAL OVERSIGHT COMMITTEE

Representatives from the division participate in meetings of the LOC, an organization chartered under the TOA. The LOC's mission is to ensure that the best interests of member communities are protected and that public funds are used wisely during cleanup, continued operation, and reindustrialization at the ORR. The LOC is governed by a board of directors, which includes local elected and appointed officials from the city of Oak Ridge and the counties of Anderson, Roane, Knox, Loudon, Meigs, Rhea and Morgan. Board members are concerned with human health and the environment, emergency management issues, and any impacts on their communities' economic and social well being.

The board is advised by a 20-member Citizens' Advisory Panel (CAP), which was created in early 1995 to provide advice based on in-depth reviews of DOE documents and studies of community concerns. CAP meetings often begin with presentations by experts on issues of current interest to the greater Oak Ridge community. At the March 11, 2003, CAP meeting, representatives of the division's programs gave presentations on their respective contributions to the 2003 Environmental Monitoring Plan.

CAP members attend meetings of other organizations concerned with environmental, economic, and health issues in order to better evaluate the range of stakeholder opinions. The CAP regularly transmits public concerns to the LOC Board and to DOE, EPA, and TDEC.

In the past year, issues addressed by the LOC and the CAP have included the following:

- The environmental management budget process and its implications for cleanup on the ORR,
- Implementation of the Accelerated Cleanup Plan for the ORR,
- Community concerns over long-term stewardship of remediated sites,

7.0 Outreach

- Historic preservation on the ORR and its appropriate integration with cleanup planning and activities,
- Capacity and use of the CERCLA waste disposal facility for various cleanup wastes,
- Technical issues related to the decision-making process for remediation at the watershed level, and
- The roles and responsibilities of different entities and jurisdictions in emergency planning and response.

The LOC's outreach efforts include a periodic newsletter, *Insights*, presentations to community groups and governmental entities, an e-mail news list, and an Internet presence at <http://www.local-oversight.org>. The LOC is staffed by an executive director and an administrative assistant. For further information about the LOC or to be added to the newsletter mailing list, contact Susan Gawarecki in Oak Ridge by phone at (865) 483-1333, toll free at (888) 770-3073, or by e-mail at loc@icx.net.

7.3 LOCAL GOVERNMENT ENVIRONMENTAL BOARDS

7.3.1 Oak Ridge Environmental Quality Advisory Board

The Oak Ridge Environmental Quality Advisory Board (EQAB) is an official board of the city of Oak Ridge. Its members are appointed by the City Council, and the board, in turn, advises the City Council on environmental issues. Because the ORR is within the city limits of Oak Ridge, one of EQAB's primary functions is to review and comment on DOE cleanup activities that potentially affect the city. EQAB's web site is found at <http://orserv01.ci.oak-ridge.tn.us/eqab>.

7.3.2 Roane County Environmental Review Board

Members of this official Roane County governmental board are appointed by the county executive and confirmed by the County Commission. The board advises both the county executive and the commission on environmental matters, including those resulting from the presence of two major ORR facilities—ORNL and ETTP—in Roane County. Roane County continues to attract commercial waste management firms interested in doing business with DOE and outside clients. In addition, three incinerators on or near the ORR are situated within county boundaries. The east end of Roane County will have a variety of DOE-related cleanup, waste management, and transportation issues to monitor for years to come.

7.0 Outreach

7.4 DOE OUTREACH

7.4.1 Oak Ridge Site Specific Advisory Board

Oak Ridge Site Specific Advisory Board (ORSSAB) is an advisory committee to DOE's environmental management organization and is chartered under the Federal Advisory Committee Act of 1972.

The board provides advice to DOE's Oak Ridge environmental management program both on policy issues and on specific decision documents. The board consists of up to 20 members from the greater Oak Ridge region who are concerned about environmental restoration and waste management. Representatives from TDEC, DOE, and EPA Region 4 attend meetings as non-voting members to act as a resource for information and to hear concerns of the board. ORSSAB's standing committees are Environmental Management and Stewardship.

All board and committee meetings are open to the public and are announced in newspaper advertisements, in the Federal Register, at the Information Resource Center in Oak Ridge, and through the board's 24-hour information line at (865) 576-4750. Board meetings are recorded on video, and copies of the tapes are available for public review. ORSSAB produces a quarterly newsletter called "The Advocate," and its Web site is at <http://www.oakridge.doe.gov/em/ssab>. Information is also available by calling the ORSSAB support office (see appendix).

The ORSSAB provides advice to DOE's Oak Ridge environmental management program both on policy issues and on specific decision documents.

7.4.2 Community Relations

DOE's Community Relations office produces two publications distributed to interested individuals. *Environmental Update* is a quarterly newsletter that explains environmental management activities and decisions either in progress or being contemplated in Oak Ridge. The monthly *Public Involvement News* summarizes upcoming public meetings, announcements, availability of documents, pending NEPA actions, and opportunities for public involvement. Individuals can be added to the Community Relations mailing list by contacting Walter Perry, manager of community relations for DOE's Oak Ridge environmental management program, at (865) 576-0885, or they can pick up a copy of either publication at the DOE Information Center, 475 Oak Ridge Turnpike in Oak Ridge.

Environmental management activities are also detailed on the Internet at <http://www.oakridge.doe.gov/em>. Links to documents and other information sources are also provided from this web site.

7.0 Outreach

7.4.3 National Environmental Policy Act

NEPA requires federal agencies to provide public officials and citizens with environmental information for proposed federal actions that could affect environmental quality. This is accomplished through the preparation of one of two documents: an EIS if the proposed action will have a significant impact on environmental quality, or an EA if the impact is not significant. The EIS requires public involvement and access to information regarding DOE proposals. Formal public meetings are held in conjunction with the scoping and release of an EIS, giving regulators and citizens an opportunity to comment openly on DOE's planned activities.

In 1994, DOE adopted a policy that combines the public involvement procedures of NEPA and CERCLA for major cleanup decisions. This policy states, "CERCLA documents will incorporate NEPA values, such as analysis of cumulative, off-site, ecological, and socioeconomic impacts, to the extent practicable." DOE's policy and announcements on pending NEPA actions are available on its web site at <http://tis-nt.eh.doe.gov/nepa>.

7.4.4 DOE Information Center

The DOE Information Center combines the administrative record formerly housed at the Information Resource Center and the documents stored at the former DOE Public Reading Room. The Information Center, located at 475 Oak Ridge Turnpike, is the official repository for all information and documents that support or compose the administrative record for the FFA. This includes such information as newspaper articles related to the ORR, official correspondence, and decision documents on site remediations. It is also the storage area for documents requested under the Freedom of Information Act, newly released or declassified files and information dealing with health issues, and documents covering all aspects of the ORR's environment not otherwise part of the administrative record.

These files are accessible to the public and may be read on the premises, or the staff will copy documents on request. The Information Center's phone number is (865) 241-4780.

Appendix

Local Government & Stakeholder Organizations

The Oak Ridge Reservation Local Oversight Committee, Inc. (LOC)

Susan Gawarecki, Executive Director
102 Robertsville Road, Suite B
Oak Ridge, TN 37830
Phone: (865) 483-1333
Fax: (865) 482-6572
E-mail: loc@icx.net
Web site: <http://www.local-oversight.org>

City of Oak Ridge Environmental Quality Advisory Board (EQAB)

Ellen Smith, Chair
City of Oak Ridge, P.O. Box 1
Oak Ridge, TN 37831-0001
Phone: (865) 482-8320
Fax: (865) 425-3426
E-mail: EQAB@cortn.org
Web Site: <http://www.cortn.org/eqab/>

Roane County Environmental Review Board

Ed Strain, Chair
Roane County Courthouse
P.O. Box 643
Kingston, TN 37763
Phone: (865) 376-5578
Fax: (865) 376-4318
E-mail: edstrain@icx.net

Oak Ridge Site Specific Advisory Board

David Mosby, Chair
P.O. Box 2001, EM-90
Oak Ridge, TN 37831
Phone: (865) 241-3665
Fax: (865) 576-5333
E-mail: brandstettkj@bechteljacobs.org
Web Site: <http://www.oakridge.doe.gov/em/ssab>

League of Women Voters of Oak Ridge

Margaret Beams, President
P.O. Box 4073
Oak Ridge, TN 37831-4073
Phone: (865) 482-2243
E-mail: lwvor@bellsouth.net
Web Site: <http://www.lwvor.com>

Community Reuse Organization of East Tennessee

Lawrence Young, President
107 Lea Way
P.O. Box 2110
Oak Ridge, TN 37831-2110
Phone (865) 482-9890
Fax (865) 482-9891
E-mail: younglt@croet.com
Web Site: <http://www.croet.com>

East Tennessee Environmental Business Association

Jenny Freeman, Executive Director
P.O. Box 5483
Oak Ridge, TN 37831-5483
Phone: (865) 483-9979
Fax: (865) 481-8928
E-mail: jenny@eteba.org
Web Site: <http://www.eteba.org>

Atomic Trades and Labor Council

P.O. Box 4068
Oak Ridge, TN 37831-4068
(865) 483-8471
Web Site: <http://www.atlcunion.org/>

Appendix

Paper, Allied-Industrial, Chemical, and Energy Workers International Union Local 5-288

133 Raleigh Road
Oak Ridge, TN 37830
Phone: (865) 483-3745
Fax: (865) 483-6460
E-mail: pace@icx.net
Web Site: <http://www.paceunion.org/>

Oak Ridge Reservation Health Effects Subcommittee

Bill Taylor, Administrator
ATSDR Oak Ridge Field Office
197 S. Tulane Avenue
Oak Ridge, TN 37830
Phone: (865) 220-0295
E-mail: wxt4@cdc.gov
Web Site:
<http://www.atsdr.cdc.gov/HAC/oakridge/>

Coalition for a Healthy Environment

Harry Williams, President
12410 Buttermilk Road
Knoxville, TN 37932
Phone: (865) 693-7249
Fax: (865) 531-6217
E-mail: harry.williams2@worldnet.att.net

Save Our Cumberland Mountains

P.O. Box 479
Lake City, TN 37769
Phone: (865) 426-9455
Fax: (865) 426-9289
E-mail: info@socm.org
Web Site: <http://www.socm.org>

Advocates for Oak Ridge Reservation

Gail Stakes, Chair
136 West Revere Circle
Oak Ridge, TN 37830
Phone: 865-717-3109
E-mail: gstakes@comcast.net
Web site: <http://www.kornet.org/aforr/>

Oak Ridge Environmental Justice Committee

100 Wiltshire Drive
Oak Ridge, TN 37830-4505
Phone/Fax: (865) 482-1559
E-mail: austin50@icx.net
Web site: <http://user.icx.net/~austin50/orejc.html>

State Contacts

Tennessee Department of Environment and Conservation Department of Energy Oversight Division

761 Emory Valley Road
Oak Ridge, TN 37830
Phone: (865) 481-0995
Fax: (865) 482-1835
E-mail: John.Owsley@state.tn.us
Web site: <http://www.state.tn.us/environment/doeo>

John Owsley
Director

Dale Rector
Assistant Director

Kristof Czartoryski
Waste Management

Jim Harless
Environmental Monitoring and Compliance

Doug McCoy
Environmental Restoration

Charles Yard
Radiological Monitoring and Oversight

Tennessee Emergency Management Agency

Elgan Usrey
Director, Recovery and DOE Programs
3401 Sidco Drive
Nashville, TN 37204-1502
Phone: (615) 741-0001
Fax: (615) 242-9635
E-mail: eusrey@tnema.org
Web site: <http://www.tnema.org/>

Bob Roddy
East Region DOE Program Manager
836 Louisville Road
Alcoa, TN 37701
Phone: (800) 533-7343 (in state)
Phone: (865) 981-5640
Fax: (865) 981-5610
E-mail: broddy@tnema.org

Tennessee Department of Environment and Conservation
DOE Oversight Division

761 Emory Valley Road
Oak Ridge, TN 37830
Phone (865) 481-0995
Fax (865) 482-1835

